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Steel Castings.

A method has recently been devised by which wrought iron can be melted, and poured into molds, producing castings which retain all the toughness and qualities belonging to wrought iron. Scrap or wrought iron may be employed, or bars or plates cut into small pieces, these being melted in crucibles such as are used for melting blistered steel. To a charge suitable in amount to the crucible, one-half of one per cent. of charcoal, (by weight,) one per cent. of manganese, and one of red ammonia are added. The whole is covered from the atmosphere and melted in a temperature of about fifteen hundred degrees Fahrenheit, which temperature is maintained for three hours. The metal is then poured into molds. The iron thus cast is so malleable as to be capable of being treated under the hammer in the forge, and thus part of the iron may be shaped in molds and part completed by forging, producing ornamental work.

[The above is copied from an exchange, and we consider it a good recipe for converting wrought iron into cast steel. Any one who may try the experiment will find it to produce a good result. Let them smelt all the given ingredients in a crucible, skim off the scoria, and pour out the metal into ingot molds, and they will find very good cast steel.

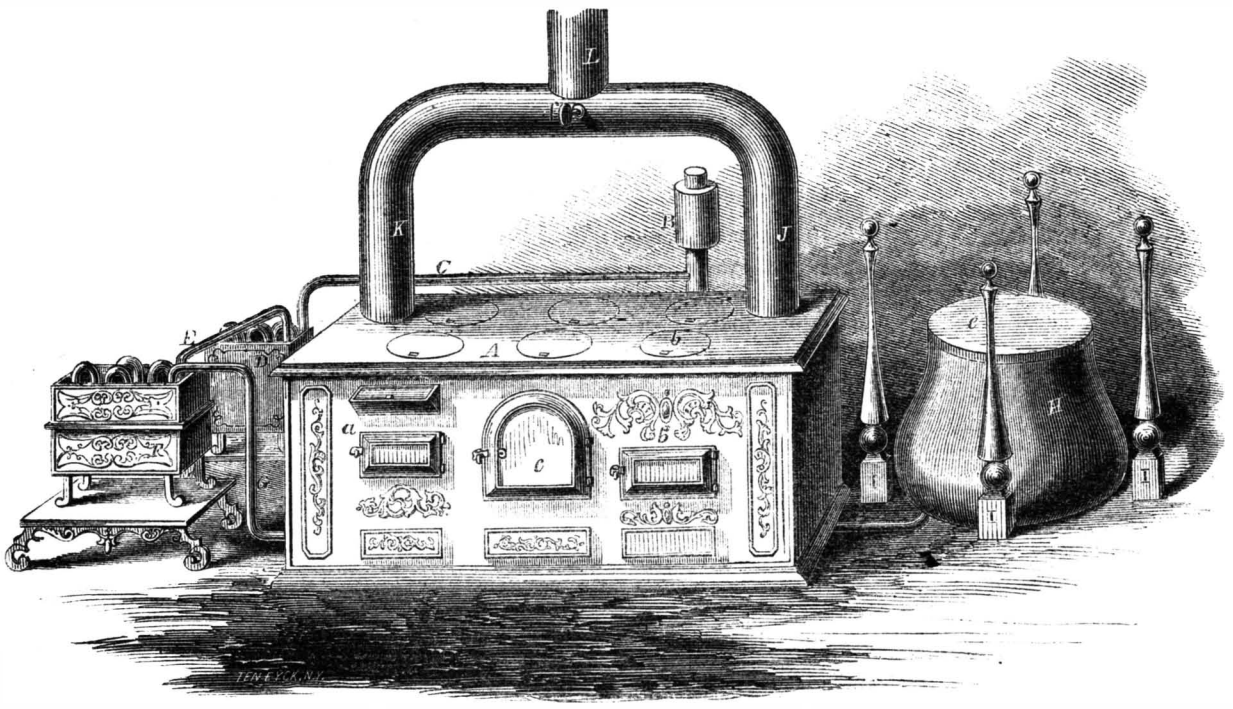
Russia Sheet Iron.

It is a popular notion that the process of manufacturing the tenacious and glossy "Russia sheet iron" is a profound secret and that the vigilance of the Russian government and the Russian manufacturers has hitherto successfully prevented all foreigners from obtaining the slightest information on the subject. The present Commissioner of Patents, in his last report, also alludes to the manufacture of this article as one of the great unsolved problems in science, which the industrial interests of the country require should be explained.

Mr. Wells, in his recent work, "Principles and Applications of Chemistry," states that this current belief has no foundation in fact, and that the method of preparing the iron in question is perfectly well known. According to the authority quoted, "Russia sheet iron is, in the first instance, a very pure article rendered exceedingly tough and flexible by refining and annealing. Its bright, glossy surface is partially a silicate, and partially oxyd of iron, and is produced by passing the hot sheet, moistened with a solution of wood-ashes, through polished steel rollers."

Another mythical bubble is thus punctured, and the wonderful story of guarded founderies and ever-watchful officials, as connected with Russia sheet iron, will take rank with the account of "Symmes Hole," and the barnicles which turn to Solon geese.—*Exchange.*

HENDRICKX'S GAS APPARATUS.



There is little doubt that gas, as supplied to consumers in our large cities in charged a most unwarrantable and extravagant price, and very often the quality is not the best. Many methods have been adopted to lower this price, but in most instances have proved unsuccessful, and the only way now left is for such as have large houses, hotels, public buildings, &c., to make their own gas, and prove to the gas companies their independence. In the country, where no gas-works are erected, the ever-dangerous "burning fluid" is used as an illuminating material, and the results, in the form of accidents and loss of life, we read in every newspaper. The most safe, cleanly, and cheap illuminating agent has been unquestionably proved to be coal or other gas, the former being most easily manufactured, and the raw material generally at hand. Many individuals would willingly fit up a private gas-works, but they have not, in the first instance, the room to spare in their garden or grounds, and secondly, few feel inclined to go to the expense of putting up gas-works for their own private use.

In order to enable every family to make their own gas, A. Hendrickx, of this city, has invented the arrangement that forms the subject of our illustration. It is a combination of a cooking range and a gas apparatus, so that the waste heat from the range can be made to aid in the generation of gas, and the coke produced in the retort will, in a great measure, supply the fuel for cooking. The perspective view of the apparatus above may be easily understood.

A is a cooking range, having on its top plate the openings, *b*, for pots and pans, an oven, *c*, and fire door, *a*. This cooking fire is connected by a flue, K, with the chimney, L, so that it is perfectly independent of the retort, and can be used alone when it is not requisite to make gas, the retort being placed through the back of the range on the opposite side of the oven, and its fire door is seen at *b'*. The flue of the retort fire is indicated by J, and communication can be opened between it and L by the damper, *f*, which enables only one or both fires to be lighted and used.

As it is supposed that this apparatus will have to be attended to by domestics who are not used to manage such contrivances, it has been made as simple as possible; and in the pipe which conducts the gas from the retort to the condensers there is a safety valve, B, (on which there is a special patent) the use of which renders explosion almost impossible; and no matter how careless the attendant may be, the retort being once filled with coal, the door closed, and the fire attended to, the apparatus will continue to work with safety and perfection as long as there is any gas in the coal, as, should the gas be generated so quickly as to produce a dangerous pressure in the retort, it will elevate the safety valve—which is simply an inverted cup over a pipe, and surrounded by water—and pass quietly into the air, without any dangerous results. The gas passes from the retort through pipe, C, into the condenser and cooler, D, where it parts with its tarry matters and other impurities, and from that it passes by pipe, E, into another purifier, where the sulphur is separated, and the gas thoroughly cleansed by a special composition adapted to this apparatus. This gas is finally led through pipe, G, into the gasometer, H, placed between the posts, I, which is an india rubber bag of any suitable size, and which is provided with a flat top, *e*, that can be weighted to force the gas to the burners with any desired pressure.

We have seen one of these combination cooking ranges and gas generators at work, and were highly pleased at its economic results. It is free from the many objections which are raised against rosin and rosin oil apparatus, and it is every way adapted to supply large or small houses with that most necessary of all blessings—light.

The patents are dated April 27th, July 27th, and August 3d, 1858. Any further information as to cost, agencies, &c., can be obtained by addressing Hendrickx Brothers, Gas Generating and Cooking Range Co., No. 512 Broadway, New York.

Animal Curiosities.

The tongue of a cat is a singular instrument. It is her currycomb. For this purpose it is rough, as you will find it if you feel it. When she cleans herself so industriously, she gets off the dirt and smooths her coat just as the ostler cleans and smooths the horse's coat with the curryoomb. Her head she cannot get at with her tongue, and so she has to make her fore-paws answer the purpose instead.

There is one bird that lives chiefly on oysters. It has a bill, therefore, with which is opens an oyster as skillfully as an oysterman can with his oyster knife.

Some birds can sew very well with their bills and feet. There is one bird that sews so well that it is called the tailor bird. Its nest is hid in leaves which it sews together. It does this with a thread which it makes itself. It gets cotton from the cotton plant, and with its long, delicate bill and little feet, spins it into a fine thread. It then pierces the holes through the leaves with its bill, and passing the thread through the holes, sews them together. We believe that in getting the thread through the holes, it uses both its bill and feet.

Novel Experiment in Ship Building.

The Boston *Journal* describes a steamer which is now being built at East Boston, and is to be propelled in a novel manner. She is built as an experiment, the inventor being furnished with the necessary funds by some of the leading shipbuilders of Boston. The hull is fifty-two feet long, and thirteen feet wide at the stern, and tapers gradually at the bow, which is very sharp. She is five feet deep. On deck she will have a cabin 19 feet long. She will be worked by an engine of 12-horse power, to which will be attached two propellers—one at the stern, three feet in diameter, to work in the water, and one at the stem, eight feet in diameter, to work in the *air*. The air propeller is attached to a shaft which connects with the engine and the water propeller at the stern. It is supported by a post at the stem. Both propellers will be worked by steam. The smoke pipe will lie horizontally on the deck. The inventor is confident that by this arrangement he can easily get 25 to 30 miles an hour speed out of this craft.

The South Carolina Blue Ridge Railroad has a summit of 2,151 feet, passed by a tunnel 5,562 feet long, and approached by gradients of 1 in 75.

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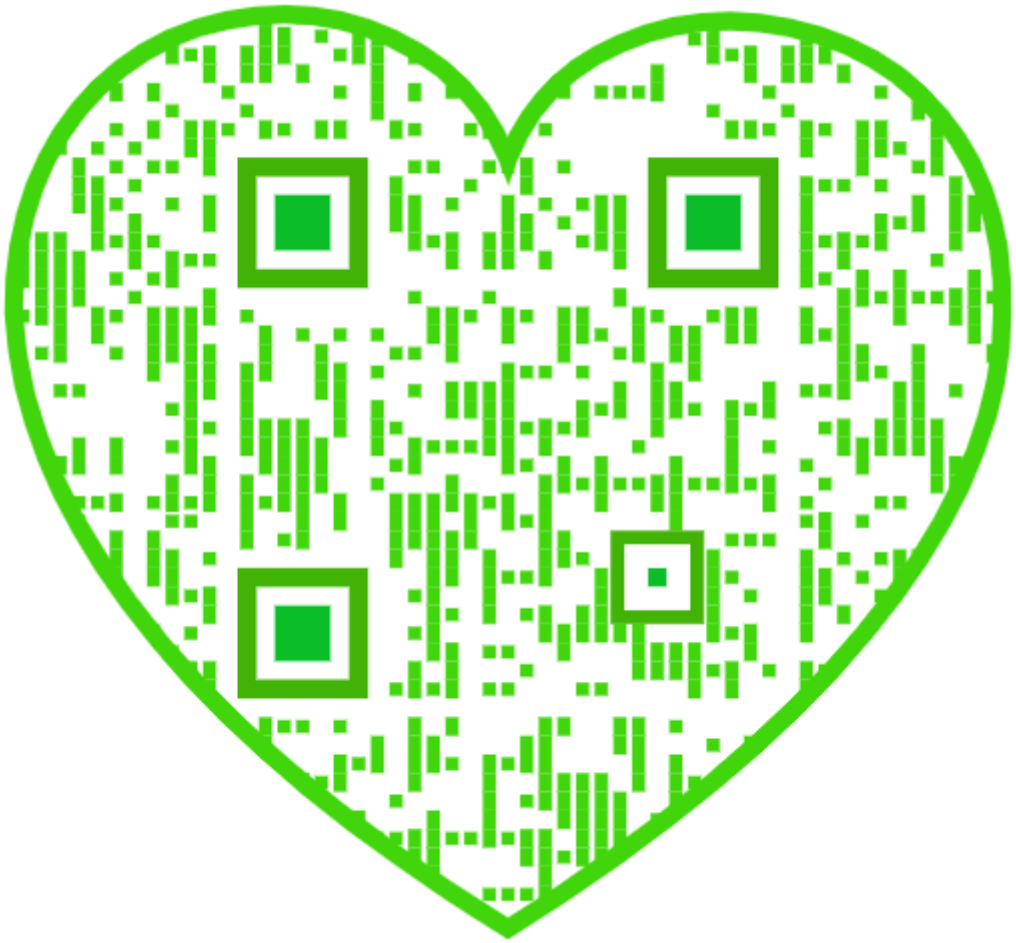

Issued from the United States Patent Office

FOR THE WEEK ENDING NOVEMBER 23, 1858.

[*Reported officially for the Scientific American.*]

* Circulars giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

REFRIGERATOR—Abel H. Bartlett, of Spuyten Duyvil, N. Y. : I claim the wedge form and position of the ice and water receptacle, D and C', dividing the provision chambers, B B, arranged substantially as and for purposes specified.

SASH FASTENER—John Bestwick, Jr., of Dedham, Mass. : I do not claim, separately, the eccentrics, D, for they or their equivalents have been previously used.

Neither do I claim a sliding spring bolt, f, for they are commonly used.

But I am not aware that eccentric and slide bolt have been used in connection as a sash fastening, and placed in such relation to each other as shown and described.

I claim, therefore, as a new article of manufacture, a sash fastener having an independent eccentric, D, and an independent bolt, f, combined and arranged as shown and described.

[A notice of this improvement will be found in another column.

TRUSS BRIDGES—John C. Briggs, of Concord, N. H. : I claim the application of india rubber or equivalent springs to the compressed joints of truss frames and truss beams, substantially in the manner and for the purposes described.

DEVICES FOR CLAMPING AND FEEDING THE BOLT IN FELLY SAWING MACHINES—Derwin E. Butler, of Chesterfield, Ohio : I claim, first, The bed, G, arranged with the rods, d d, arms, e e e' e', connected by the bar h, and the spring, H, for the purpose of readily operating the bolt, L, for feeding and removing the same from the saws, as described.

Second, The jaw, J, formed on the bent bar, K, attached to the bed, G, and spring, J, so that the jaw may be operated to grasp the bolt, and the bolt relieved therefrom by the movement of the bed, G, substantially as set forth.

[For more information about this invention see another page.]

MACHINE FOR SPLITTING LEATHER—Henry E. Chapman, of Albany, N. Y. : I claim the arrangement of the dished circular knife, C, the series of split springs, G G G G, and the sliding bed, D, in their relation to each other, as described.

APPARATUS FOR HEATING AND VENTILATING BUILDINGS—William H. Churchman, of Janesville, Wis. : I claim the arrangement and combination of the induction and eduction flues or venti-ducts, K K', the continuation flue of the venti-duct, K', the damper, j, and the registered openings, f g h i, whereby any number of the rarifying drums, D, with their accompanying venti-ducts, K K', may be used at pleasure, either for warming or ventilating alone, or for both at the same time, as described.

[For more information regarding this invention, see another column.]

METHOD OF REGULATING THE WINDING OF TIME-KEEPERS—Jonathan Dillon, of Washington, D. C. : I claim the described method of making springs or coils self-regulating, by the use of the slot and lever, or by any other similar device acting substantially in the same manner, and for the purposes and uses expressed.

BLACKSMITH'S TUYERE—Benjamin E. Dixon, of Marshall, Mich. : I do not claim the mode of protecting a tuyere by the introduction of water, for that has long been known and used.

But having described my improvement, and shown its applicability to water tuyeres, I claim the mode of regulating the length of the discharging orifice in a water tuyere, by means of the oblong tapered wind chamber, A, with grooves or other equivalent device in its casing, in combination with one or more of the tapered plugs, P P, rods, R R, and the detachable cover, D, to be used for the purposes and in the manner substantially as described and set forth.

CHIMNEY CAPS—Charles Douglas, of Cleveland, Ohio: I claim the frame, A A A A, the valves, C C, the cap, D, and the plan of linking the valves and cap together, to give them their proper relative positions, all substantially as described, and for the purposes set forth.

MACHINES FOR BREAKING STONES FOR BALLASTING RAILROADS AND TURNPIKES—A. C. Ellithrope and Ives Scoville, of Chicago, Ill. : We claim the cylinders, A B, constructed with a solid base, C, and sectional shell D D D, when the said shell is made in segments, and dovetailed and secured together, and dressed with teeth shaped and set as described, and when the said cylinders are used for breaking stone for macadamizing or ballasting railroads, &c., substantially as set forth.

PICKER STAFF FOR LOOMS—Samuel Estes, of Newburyport, Mass. : I claim my improved arrangement of the picker staff, D, with the guide, D, with respect to the outer end of the passage. a, the same being substantially as shown in the drawings, and as described.

MODE OF BAKING ARTICLES COMPOSED OF CARBON—DeGrasse B. Fowler, of New York City : I claim the manufacture of articles from a composition of carbon and gas tar, or their equivalents, when treated with pressure and heat, and baked in the presence of lime, substantially in the manner described.

GEARING—G. B. Ganster, of Reading, Pa. : I claim the arrangement on the wheels, E and F, of the plates, A A' A'', rollers or wheels, B B B, plates, D D' D'', and collars, o o o, the whole being constructed and operating in the manner and for the purpose specified.

STRAW CARRIERS—Carlos W. Glover, of Farm Ridge, Ill. : I claim in combination with a series of bars, a b, having the motions described, the spring shield for aiding to guide the stalks or other thing conveyed thereon, and for preventing their falling back or becoming entangled, substantially as set forth.

GEARING—Ebenezer A. Goodes, of Philadelphia, Pa. : I claim providing the wheels respectively with spiral projections, a, and spiral grooves, b, substantially as and for the purposes shown and described.

[A notice of this improvement is given in another column.]

BRICK MOLDS—James A. Hamer, of Reading, Pa. : I am aware that two suspended hand pieces have used. I therefore do not claim such device in itself.

But I claim the two crank rods or their equivalent, as connected with the followers and secured to the frame, and as operated upon by the hand piece, the whole being arranged and combined and operated substantially as described and set forth.

COOKING RANGES—Joshua Harrison, of New York City : I am aware that boilers have been so connected with ranges that the draft of their fires will be downward from the article being cooked; but the heat of such fires has either been conducted directly into the fire of the range, or else into a chimney or flue, and thus to a good degree lost; whereas, by my arrangement, the heat of the broiling fires is applied directly to that part of the range most distant from the main fire, and made most effective where most needed.

I am also aware that double or ventilating doors have been used, I myself having used such; but the orifices on the inside of such doors have been at or near the bottom or top, one or both; but experiments made by myself have proved that the ventilation is most effective, and its effects most desirable, when such inside orifices are not at the bottom or top, but at or near the middle of the doors, as described.

What I claim is, The arrangement and combination of the flues, C and F, with the breaks or parts, G 1 and 2, substantially as described, and the dampers, f, in connection with the main flues, F F, directly underneath the fire, for the uses and purposes set forth.

I also claim the arrangement of the broiling grates, H H, with the flue, c, for the purpose of applying the heat of such fires directly to and making it effective in heating that part of the range most distant from the principal fire.

I also claim the construction and arrangement of the top plate, D, as described, by which the front and back rails, o o, are made a part of the body of the range, while the central part of such plate is made in separate sections, the back rail being also a base or foundation for the mason work, as set forth.

COOKING STOVES—Richard M. Hermance, of Stillwater, N. Y. : I claim the arrangement of the flue slips, T T', in the chamber, D, in combination with the fire box, A, descending flues, E E', upon the sides of the stove and oven flues under and back of the oven, and exit pipe, C, arranged and operating together substantially as and for the purposes set forth.

SCREW WRENCH—Joseph Hyde, of Troy, N. Y. : I claim, first, The arrangement of the thumb piece, M, and the screw, C, in the manner and place described.

Second, I claim making the sliding jaw, E, in two equal parts, divided on a vertical line parallel with the bar, D, and the jaw, L, so as to cast the nut, R, and the recess, H, at the same casting of the said sliding jaw.

INKSTANDS—Orlando H. Jadwin, of Carbondale, Pa. : I claim in combination with a hollow plunger for raising the ink, an independent cup for holding said ink, and from which it cannot, by the ordinary want of tightness, flow back into the reservoir, substantially as described.

TOURNURES—Benjamin Johnson, of Philadelphia, Pa. : I am aware that a metallic band flared out at its lower edge has been adapted to the waist, and suspended from the shoulders simply for the purpose of hanging all the skirts of the under garments upon it, so that their weight shall be transferred from the hips to the shoulders; and that metallic ribs or fibrous webbing have been used before, for the purpose of connecting segmental and other springs so as to cause them to rest in vertical planes upon the undergarments and person, as elastic supports for the dress skirts, as in G. V. and E. A. Pierce's "bishap;" and also that a textile webbing has been used before, for the purpose of connecting together laterally, conically-formed elastic frames or spiral springs, so as to cause them to rest side by side, longitudinally against the under petticoats and the person, as in C. J. Houghton's bustle; therefore I do not claim springs or elastic strips resting either directly upon the undergarments and person, for supporting the skirts of the dress.

Neither do I claim a metallic waist band; nor connecting springs together laterally by means of a webbing of any kind in the construction of a tournure for ladies' dresses.

But I claim a curved elastic projection or support, consisting of the springs, B B' B'', and webbing, C C, or their equivalents, when the said springs are constructed, arranged and fixed to a waistband, A, so as to be held out thereby free from the undergarments and person as described, that they may operate in connection with the webbing, substantially in the manner described, and for the purposes specified.

METHOD OF NEUTRALIZING LOCAL ATTRACTION OF THE NEEDLE—Calvin Kline, of Brooklyn, N. Y. : I do not confine myself to the arrangement of the magnets within a binnacle.

But I claim applying and arranging the magnet or magnets in a horizontal position or positions below or above the needle of the compass, with opposite poles in the vertical plane of the axis about which the needle turns, and on opposite sides thereof, and in such a manner as to be adjustable on centers lying in or as nearly as practicable in the vertical axis about which the needle turns, that their poles may be made to point in any direction necessary to compensate for local attraction, and have such direction varied as may become necessary, substantially as set forth.

[A description of this invention will be found on another page.]

FURNACES FOR EVAPORATING SUGAR JUICE—Louis Lefebre, of New Orleans, La. : I make no claim to the fluting or corrugating of kettles, separately considered.

But I claim in combination with the fluted outer surface of the kettle, forming the masonry constituting the opposite face of the flue with corresponding flutings or corrugations, so as to surround the kettle with an undulating passage for the products of combustion, substantially as and for the purposes set forth.

REFRIGERATOR—Adolphus Lipmann, of New York City : I claim the described arrangement of a series of coiled pipes, E, which emanate from the ice chamber, C, and which are carried down between the two walls, a and b, of the refrigerator, to a central coil, G, substantially as and for the purpose specified.

[A notice of this improvement will be found in another column.]

SMUT MACHINES—Hugh Marshman and Charles F. Foulke, of Carlisle, Iowa. : We are aware that air has been admitted into various parts of grain-cleaning machines, and may have been in the upper portion of the spout through which the grain is discharged, and a part of the blast admitted.

But we are not aware that a blast of air has been so arranged in reference to a horizontal trunk through which the chaff and light grains have to pass, as to give an accelerated blast in the upper portion or strata of the air in the trunk, when compared with the speed of that in the lower portion of said trunk, in the manner described by us, by which the light grains are more effectually separated, as set forth.

We claim, first, The combination and arrangement of the casing, D, and funnel-mouthed opening, d, the parts being so arranged in relation to each as to, at the same time, give a converging descent to the grain, and an inward partially downward blast through it at that point.

Second, The introduction of an auxiliary blast into the upper portion of the horizontal trunk, J, as described, by which a more perfect separation of the light grain is secured, as set forth.

MOLDS FOR MAKING BOTTLES—John L. Mason, of New York City : I claim the combination of the screw thread with the rim, f, and also its combination with the rim, r, for the purposes set forth.

I also claim the combination of the grooves in the female screw of the mold with the air passages through the mold, for the purpose set forth.

I also claim the blower-over, in combination with the molds for the necks of bottles, as described.

I also claim a flanch above the "blower-over," as described, for the purposes set forth.

ORE SEPARATOR—L. Stadtmüller, of Bristol, Conn. : I claim the apparatus described for sizing ores, constructed and arranged substantially as specified.

SADDLE-TREES—Jesse Nece, of Philadelphia, Pa. : I do not claim, broadly, hinging the pommel and cantle of saddles to the side pieces of the same, being aware that such device is old.

But I claim, first, Rounding the under side of both the pommel, B, and cantle, C, of a wooden saddle-tree where they bear on the side pieces, and employing, in combination with the whole, the side strips, h and i, and h' and i', so that the said side pieces may be free to vibrate on their hinges, and still retain their proper relative position with regard to the pommel and cantle, as set forth.

Second, The metal arch pieces, E and F, secured to the pommel and cantle of the saddle-tree as described, for the purpose specified.

FARM GATE—William Newlone, of Penn Yan, N. Y. : I claim, first, The combination of the post and hinges, constructed and operating as described.

Second, The chain, E, or its equivalent, with the means for adjusting the same, as and for the purposes specified.

Third, The catches and latch, combined with the means for actuating the same, as arranged in the specification.

PRESERVING SURFACES OF CAST OR WROUGHT IRON—Charles Francis Leopold Oudry, of Paris, France : I claim, first, The employment of a varnish or of successive varnishes, insulating, metallizing and intermediary, between the object to be coated with copper—whether the same be metallic or non-metallic—and the protecting copper itself, all or a part of said varnishes being composed of certain metallic substances united with fat or essential oils, and gummy, resinous, bituminous, or asphaltic substances, substantially as described, and for the purposes set forth.

Second, The coating of all kinds of objects with copper, by the employment of one or several varnishes in succession previous to the galvanic coppering obtained directly in a bath of sulphate of copper, i. e., without the intervention of a bath of cyanide of copper, substantially as described.

BUSTLES FOR LADIES' DRESSES—George V. and Edwin A. Pierce, of New York City: We claim the springs a a, fitted into a bishap or bustle, in combination with a lining or strap forming a straight line of connection between the ends of said springs, for the purposes set forth; and in combination with said springs, a a, fitted into a bishop or bustle, in the manner specified, we claim the springs, c c, arranged and acting in the manner and for the purposes described.

We also claim the strap, f, or tape, in combination with the springs, a a, and bustle, substantially as and for the purposes specified.

GRATE BARS—Silas T. Savage, of Albany, N. Y. : I claim the employment of the bar, a, when provided with a series of flanges which form an arc above the bar, and which taper from the extremities of the chord of said arc, to or near the bottom of the bar, thus supporting the coal in arches above the bar, and at the same time strengthening and sustaining the bar by the tapering sides of the flanges, substantially in the manner specified.

KNITTING MACHINES—Frederick Schott, of Brooklyn, N. Y. : I claim, first, The combination of the levers, G and H, the dog, G', spring, k sliding bar, I, adjustable slips, K' K, and the eccentric, H', or its equivalent, on the main shaft, the whole operating substantially as described, to effect the movement of the needle bed in one and the other direction alternately.

Second, The two-grooved safety guide, K2, applied in combination with the feeder, to operate substantially as and for the purpose specified.

Third, The needle and stitch hook protector, N, applied and operating substantially as set forth.

Fourth, The combination of mechanism to operate the sinker or reliever, P, consisting of the cam, R, on the main shaft, the arm, D3, and spring, u2, on the rock shaft, the spring, w, applied to the reliever bar, P', the projection v' v2, on said bar, the stationary inclined projection, Z, on the frame, and the stationary inclined planes, Z' Z2, the whole applied and operating substantially as set forth.

Fifth, The combination of the bar, X, or its equivalent, furnished with teeth, 20 20 and 21 21, and a wedge like projection, 27, the pawl, 23, operated by the movement of the needle bed and the stop lever, W, the whole applied to operate substantially as described, in combination with a belt-shipper, to stop the machine as soon as any desired number of courses have been knitted.

[A full description of this invention will be found on another page.]

MACHINE FOR PRINTING NAMES OR DIRECTIONS ON PACKAGES, &c.—James Spencer, of Toronto, Canada : I claim the application of common type arranged in a form upon a plane bed, to the printing of successive names, numbers, or addresses, one at a time, upon papers, pages, books, tickets, or other articles requiring to be printed, marked, or addressed; and the construction of the machinery as described, or any similar combination of machinery for producing the same motions, causing the bed to traverse so as to bring all the names, numbers or addresses in the form successively under the aperture in the tympan, and causing the matter placed under the platen to receive the desired impression.

SEWING MACHINES—James H. Spencer and Thomas Lamb, of Philadelphia, Pa. : We wish it to be understood, that although we have described the shuttle as moving in the arc of a circle, we do not desire to confine ourselves to that particular movement, as a horizontal motion would be equally as effective.

We wish it also to be understood that we do not claim, broadly, causing the carrier to convey the shuttle over the required space, independently of any shuttle race.

But we claim, first, The vibrating or reciprocating carrier, h, with its permanent projections, R R, yielding projection, j, and spring-retaining catch, p, in combination with the shuttle plate, M, its casing, N, and spool, n, when the several parts are constructed substantially as described, and when they are arranged in respect to each other, and to the lip, q, as and for the purpose set forth.

Second, We do not claim, broadly, feeding the fabric by the combined vertical and lateral motion of a roughened surface feed bar on the said fabric, as such a device is described in the patent of A. B. Wilson, granted December 19th, 1854.

But we claim the arrangement of parts described for feeding the fabric, and regulating the amount of the feed, that is to say, the cams, F and G, spring rod, P, arms, w and v, the rod, z, its collar, 2, and adjustable nut, Q.

Third, The cylinders, 3 and 4, with their respective pins, when arranged in respect to each other, to receive the folds of the needle thread, as set forth, so that by turning one or both of the said cylinders, the pins may cause more or less of the folds to bear against the surface of the cylinder, as described.

WIND MUSICAL INSTRUMENTS—C. J. Van Oeckelen, of New York City : I claim, first, The application to a musical instrument of several different rows of reeds, combined in such a manner that each key of the instrument can produce several different sounds, by causing one or several reeds to vibrate according to the pleasure of the performer, preserving always, nevertheless, the proper musical expression of the note, in the manner substantially as described.

Second, The arrangement of the several parts in such an instrument by which the power is obtained of causing each note to vibrate on itself, and independently of all the others in the manner substantially as described.

Third, The application to a musical instrument, the sounds of which are produced by the vibration of reeds of several rows of valves so arranged as to act one upon the other, and that the valves of the different rows thus connected can be opened either all together or only one or more at a time by touching the same key of the instrument at the pleasure of the performer, preserving always nevertheless the proper musical expression of the note, in the manner substantially described.

MANUFACTURE OF SEWING NEEDLES—Henry Walker, of Alcaster, Warwickshire, and Gresham Street, of London, England. Patented in England May 19, 1858 : I claim forming the eyes of needles in the cylinder of the wire, without flattening the same by means of the double grooves, E, substantially as and for the purposes specified.

THRESHING MACHINES—M. D. Wells, of Morgantown, Va., and Harrison Hagans, of Brandonville, Va. : We claim the combination of the bifurcated spikes, a, of the cylinder, with the peculiarly notched ribs, R, of the concave, operating together as described.

PARASOLS AND UMBRELLAS—Edward Young, of Philadelphia, Penn. : I do not claim to be the inventor of any of the parts severally described, the same being all known and common devices.

But I claim the combination and arrangement of the stationary tube, c, with the swivel rod, d, substantially as set forth and for the purposes described.

SEWING MACHINES—H. W. Harkness (assignor to himself and W. H. Nettleton), of Bristol, Conn. : I do not claim feeding the cloth in sewing machines by pressure between two flat smooth surfaces; neither do I claim feeding cloth by a revolving wheel and vibrating clamping surface, nor between two wheels with either smooth or roughened surfaces, but I am not aware of any previous instance in which a smooth pressure foot reciprocating on the surface of the cloth and holding the same down on to the stationary bed, has effected the feeding of the cloth by a vertical clamping surface rising through a slot in the bed, and acting against the end of said smooth pressure foot, forming a bend or angle in the cloth that insures a firm hold with very little pressure of the foot on the bed : therefore—

I claim feeding the cloth to sewing machines by the combined action of a smooth reciprocating pressure foot and a vertical clamp acting at the end of said foot to hold the cloth firmly while being moved, the bend or angle thus formed in the said material enabling the feed to act with but little pressure on the goods from the smooth foot-piece, as specified.

GRAIN AND FRUIT DRYERS—Chas. A. Haskins and G. Macardle, of New York City, assignors to Joshua A. French and Eliza C. Tyrrell, of Jersey City, N. J.: We claim the traveling pipes and adjustable drums, and the form of the drums through which the hot air is compressed and distributed over and through the material to be dried. Also, the carriage and seats upon which the drums are adjusted, supported, raised and carried in combination with the pipe journal, H, gear wheel, o, and chamber, G, substantially as described.

RECLINING CHAIR—A. E. Kendall and P. K. Keyes, (assignors to themselves and C. W. Elton), of New York : We would here remark that we do not confine our invention to this description of chair alone, as we intend to apply it to such articles of furniture as required the reclining position for the comfort and convenience of the occupant.

We claim, in combination with the swinging post, E, jointed arm, D, and back, C, the employment of a serrated segment, F, and fastening, e, constructed and operating substantially as set forth and for the purposes specified.

LOCKS—Wm. Moore, of Brooklyn, N. Y., assignor to G. L. Cameron, of Chester, C. H., South Carolina : I do not claim in itself a check tumbler moving on a center pin.

But I claim as an improvement on my said patent of September 14, 1852, the cheek tumbler, l, and spring m, in combination with the tumbler, f, that is acted on from both key-holes, h and i, substantially as and for the purposes specified.

COOKING STOVES—Gibson North (assignor to North, Chase & North), of Philadelphia, Pa. : I claim the arrangement of the grooved back of the fire chamber, the cold air chamber in the flue and the guard plate at the corner of the oven, substantially as described and for the purposes specified.

SEWING MACHINES—James Perry (assignor to Isaac C. Noe), of New York : I do not limit myself to the precise construction and arrangement of the parts, as these may be variously modified without affecting the principle or mode of operation which I have invented and claim to be new and useful; nor do I wish to be understood as claiming any particular device simply to catch a loop and to move the same that the needle may enter it.

I claim the combination and arrangement of the levers and cams for imparting the three reciprocating movements to the looper, namely, that in the arc of a circle, the lateral and the vertical, in the manner substantially as described for the purposes specified.

Also, the shield, i', in combination with the looper and needle, arranged and operating in the manner described, for the purpose of presenting the loop to the looper with greater certainty.

MACHINE FOR MAKING ENVELOPES—M. G. Puffer, (assignor to Cyrus White and L. A. Corbin), of Rockville, Conn. : I claim, first, the shape essentially of the cams, Nos. 1 2 3 4 5 6 7 8 9, for the purpose set forth.

Second, The employment of the jack, F, arm, C, operating as described, to paste and lift the paper, and the fly, b, to separate it therefrom on to the carrier, H, as described.

Third, The carrier, H, shaft, o, fingers, n, arm, w, stud, p, catches, m, and arms, j, for the purpose as described.

Fourth, The combined action of the bed, N, with the plunger, R, for the purpose, as described; also the employment of the springs in the plunger, R, for the purpose as described.

Fifth, I claim the folding flaps, o, projecting from the center, or nearly so, from the end of a shaft or shafts, and having their bearings on one end or on each end thereof, whether with or without the half circle, x x, substantially as shown and described.

Sixth, The construction and arrangement of the catch wheel, t, with a long tooth, q, and guard, y, for the purpose as described.

Seventh, The arrangement of the nippers, T', operating in the manner and for the purpose described.

MACHINES FOR TARRING ROPE YARN—John Stewart (assignor to Charles Wall), of Brooklyn, N. Y. : I claim the employment within the tar vat of one or more series of sheaves or conductors over or round which the yarns are bent in the manner described, to open their fibers, and make them pass and return in an opposite direction through the tar for the purpose set forth.

[A paragraph relating to this invention will be found on another page.]

APPARATUS FOR BORING WELLS—I. M. Butler, of Oxford, Miss. ; I claim the square-chambered auger, a, constructed substantially as set forth.

RE-ISSUES.

WOOD SCREWS—The Eagle Screw Company, (assignees of Thomas J. Sloan,) of Providence, R. I. Patented Aug. 20, 1846 : Claims—First, Making the core with a conical point, substantially as described, in combination with the thread, formed on such conical point of a gradually less depth as it approaches the apex of the core, and with the several convolutions on the body, at equal distances apart, substantially as and for the purpose specified.

Second, Making the core with a conical point, substantially as described, in combination with the thread, formed on such conical point of a gradually less depth as it approaches the apex of the core, and with the several convolutions on the body, at equal distances apart, substantially as and for the purpose specified.

Third, Making wood screws with the core or a conical shape along that part of the length of the screw extending from where the thread begins on the shank, to where it becomes of full depth, substantially as and for the purpose specified.

Fourth, Making wood screws with the core of a cylindrical or nearly cylindrical form, and with a conical point in combination with the thread of equal pitch along the conical point and body, that is, with all the convolutions at equal distances apart, and of gradually less depth from the base to the apex of the core, substantially as described.

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REDUCING THE FRICTION OF JOURNALS OF AXLES ON RAILWAYS—J. K. Denning, of New York City, assignees of Leon Joseph Pomine De Mirimondi, of Paris, France. Patented Aug. 23, 1856 : I claim the arrangement for the semi-boxes for resting on the journals of the friction rollers within the upper part of the main part of the main journal box, and entirely enclosed within the said main box, substantially as described, in combination with the axle journal on which the rollers rest to sustain the load, as described.

I also claim taking the lubricating matter from the looser part of the main box, and applying it to the journals of the rollers by the projections at the ends of the axle journals.

I also claim the method of lubricating the journals of the rollers, and the periphery of the axle journal and the rollers, by the projections on the axle which in rotating take the lubricating matter from the reservoir in the main box, and apply it to the journals of the rollers above, that the drippings therefrom may lubricate the periphery of the rollers and axle journal, substantially as described.

WATCH CASES—Elihu Bliss, of Newark, N. J. Patented April 13, 1856 : I claim arranging the push piece which passes through the pendent, substantially as described, in combination with the pin, h, and so as to operate the spring catch to the closed bizzle of the outer case, when the face of the watch is in either position, as set forth.

I also claim arranging the case of the watch which contains the movement, and which carries the dial within a surrounding ring or rim, so that it can be turned within the said ring and in the plane thereof, substantially as described and for the purpose set forth.

I also claim arranging the journals by which the body of the watch is attached to an outer case, and on which it turns reversed so as to leave the works of the watch free to be shifted in its surrounding ring, substantially as described.

DESIGNS.

STOVE PLATES—Samuel D. Vose, of Albany, N. Y. Four cases.

Notes on the Progress of the Paddle and Screw.—No. 3.

Having thus noticed the paddle-wheel generally, as to when it was introduced, how it was turned, and where it was placed, I may proceed to consider various plans and inventions relating to its several parts; but it is to be distinctly understood that I refrain from comparing the relative merits of these different suggestions.

Beginning, then, with the shaft and wheel, as a whole, we find that Tremeere (1801) and Robinson (1826) supported it on a stage, to be raised and lowered by ropes. For the same purpose Melville (1845) used a cogged sector, and Drake (1851) employed screws. The connecting rod had a screw joint, which allowed the rod to accommodate its length to the varied distances between the piston rod and the shaft. Coles (1839) supported the shaft on friction wheels.

To enable the engineer to use only one wheel at a time, Gough (1828) put each on the shaft of a separate engine, while in Field's plan (1841) the wheel was disconnected by moving it and the part shaft horizontally. For the same purpose Wilkinson (1835) moved a sliding crank plate along the divided shaft, until the crank pin locked into it. Brunet (1843) used a sliding ring and bolts; Thomas (1851) employed wedges and a friction cushion. In Seaward's plan (1840) the parts were coupled by friction surfaces, screwed up to close contact. Trewhitt (1840) tightened a friction strap by cutters; Bodmer (1843) and Borrie (1843) used cog wheels; Scott Russell's patent (1853) gearing, worked by the motion of the shaft, is applied to the *Leviathan*. Price (1823) used intermediate wheels to regulate the relative speed of the engine shaft and paddle shaft. The groove and stud apparatus of Parlour (1838) gave the wheel twice the speed of the engine shaft. Murdock (1839), Brown (1842), and Bodmer (1844), had plans somewhat similar.

The modifications of the wheel itself are difficult to classify. Barton (1820), Sang (1852), Bellford (1853), and many others, made it a buoyant drum. Stevens (1827) put floats on three arms, not in the same plane. Springs were introduced by Adams (1839 and 1855) to ease concussion. Skene (1827) had side plates on the rims. In Tayler's plan (1840) one wheel might be covered from the water by a shield. Essex (1838), by dividing the wheel horizontally, folded back one part by hinges on the rim; while in Drake's plan (1851) the arms fold on hinges, like a fan. Galloway (1832) and Herbert (1855) attached an additional wheel, by a short shaft jointed to the outer end of the other, so that the rims of the wheels approached water, and were more apart at the upper edges. Daubeny (1840) made the second outside wheel turn slower than the inner one, but in a parallel plane.

Let us next turn attention to the floats or paddle boards, and first as to those that are immovable on the wheel. Floats of the simple rectangular radial form were the earliest in use. Pitot (1729) put floats in planes tangential to the surface of a cylinder on the shaft; Perkins (1829) placed them at an angle to the shaft; Sharpley (1856) aggregated them into one continuous spiral rib; Galloway (1832) used two sets of floats, inclined in different directions; Chatterton (1842) and Stevens (1851) inclined each float in an opposite direction to the next, which projected beyond it at one end. Brooman (1852) put the oblique floats with one end further from the shaft than the other; Carter (1832) put a valve between each pair of inclined floats. This was to let out the back water, which was effected in Pickworth's plan (1836), by louvre boards in the float, in Elvey's (1837) by a valve, and in Woodley's (1839) by holes bored diagonally through the float. Galloway (1835) divided the float horizontally, and put the parts successively in advance of each other. In Gemmel's plan (1837) the middle part was foremost, and Jones (1847) made the parts to overlap.

The edges of floats were curved by Robertson (1829), Ruthven (1830) made them of a barrel shape, and there is scarcely any other form which has not been proposed for them at one time or another. Hollow floats were used by Berry (1831), to condense the steam conducted through the arms.

Floats were made movable, for reefing, shipping, and feathering. For reefing, Parr (1825) made the floats slide on the arms with joints. Galloway (1843) placed the movable pieces on a separate inside wheel, moving laterally on a hollow shaft; and Brunet (1843) placed them on different sides of the arm. Massie (1836) dividing each float into parts with parallel bars, caused one set to move over the other for reefing. For attaching the floats, Hamond (1844) used wedges, while screws were employed by Brown (1847).

Hall (1839) and Bird (1842) protruded them by a fixed spiral groove. They might be folded on hinges in Tremeere's plan (1801), and were worked through screw rods by Holebrook (1838). In Leeming's plan (1835) and Newton's (1843), each float protruded during part of every revolution. Redmund (1838) made them fall back by hinges as they revolved. Each float ran out and in by its buoyancy in Oxley's plan (1845).

"Pass the Pepper."

Of all the aromatics which are partaken of by man as flavorers to his food there is none more common than pepper, and when unadulterated, its tendency, in small quantities, is rather to aid digestion than otherwise. The three important peppers commonly found on the dinner table are white, black, and cayenne, all natives of the tropics. They are much used (to stimulate digestion) by their human brethren—those hot and choleric old nabobs who confer a benefit on the world by living in hot climates far removed from the haunts of civilized life. Thus the *chow-chows*, *curries*, and other hot dishes so relished by your yellow-faced East and West Indians owe their flavor and pungency to the amount of pepper that they contain.

There is one variety of the genus *Piper* to which the white and black peppers belong (cayenne being a member of the genus *Capsicum*—called so, by the bye, from a Greek word whichsignifies to bite); this variety is a great favorite with housekeepers and cooks, and has received from them the flattering name of "allspice," as it combines in itself the flavor of cloves, nutmeg, and cinnamon; it grows plentifully in Jamaica and other American islands, where it was first discovered by the Spaniards, who gave it the name of *Pimenta de Jamaica*. The French call it the "round clove."

Black pepper is cultivated in large quantities in Malacca, Java, and especially at Sumatra, the trade of these places being almost exclusively in these spices. A pepper garden during the ripening of the pod is a lovely sight, being a large plot marked out into regular squares of six feet, in each of which are planted young trees called *chinkareens*, that serve as props to the pepper vines. When the prop has reached twelve feet high, it is cut off and the vines planted, two to each prop. A vine is three years in coming to maturity, and the fruit, which grows in long spikes, is three or four months in ripening. The berries are plucked as soon as ripe, and spread on mats upon the ground to dry, by which process they become black and shriveled, and are imported here as black pepper. In this city, and distributed throughout the States, are many mills where pepper is ground, and, we are sorry to say, it often sophisticated with burnt crust of bread and other adulterations.

The Sumatrans once did a genuine Yankee trick in connection with pepper, which is worth recording. They steeped the pepper corns in water until their shells or outer coat burst and then drying them without it, sold for three times the price of the black, as a different species, to the East India Company, who then monopolized the pepper trade. The company, having swallowed the story, made the buyers swallow it too, and ever since we have had the two peppers, white and black, both coming from the same plant, but one possessing its coat, and the other being deprived of that useful appendage, and so weakened in its pungency. The effect of pepper is stimulative and carminative, and as a condiment it seems not only to add a peculiar flavor of its own to dishes into whose composition it may enter, but also to develop the flavor of the other ingredients. Taken in small quantities it warms the whole system, but if a large dose be placed on the palate, it seems to burn the tongue, and throw the whole mouth into a perfect glow. As a medicine it has been proved beneficial in cases of vertigo, paralysis, and intermittents. The pungency depends on the presence of an aromatic resin, which can be extracted by ether and alcohol, and partially by water.

Cayenne was first noticed on the coast of Guinea, and has been generally used by the natives of those climes in which it grows as a strengthener for the stomach. It is an extraordinary fact, but still true, that although savages may be unacquainted with the polite arts, they are generally well informed upon the subject of gastronomy, and to suit their sometimes peculiar tastes, they generally discover all the edible good things which their native soil affords. It cannot be denied that hunger and the palate are great equalizers, and the stomach, much as we abhor gluttony, does much for civilization; in fact, his stomach and its wants distinguish man from the brutes, for, as Dr. Kitchener correctly observed, "Man is the only cooking animal."

The cayenne of commerce is the grain or seed of the capsicum ground and mixed with flour and then baked into little cakes in an oven; these are again broken up and mixed with more flour and placed in jars for sale. The tree or plant is very beautiful, and forms a great ornament to a garden, but it is very tender and requires much care. It is more pungent than either white or black peppers, and is often adulterated with logwood and mahogany sawdust and red lead; this latter can, however, be easily detected by placing a spoonful carefully in a glass of water, when, should it contain any red lead, it will from its specific gravity quickly drop to the bottom, while the cayenne will sink but slowly. A very pleasant drink may be made for these cold winter nights, and one that is healthy too, from pepper. Here is the recipe:—Place three or four lumps of sugar with half a teaspoonful of pepper in a tumbler and fill up with hot water; when the sugar is dissolved, drink. It is not only pleasant to the palate, but warms the whole body more effectually and quicker than any spirits. Those of our readers who try our recipe once will often, during the coming winter, when the fire burns low, and they feel chilly generally, exclaim in the language of our caption, "Pass the pepper."

Compass Compensator.

The mariner's compass is often found to indicate wrongly from what is called "local attraction" affecting the magnet; this is peculiarly the case in iron ships. Calvin Kline, of Brooklyn, N. Y., has invented and patented this week an arrangement to correct or counteract this. The nature of the invention consists in the arrangement of one or more magnets in a horizontal position, below or above the needle of the compass, with opposite poles horizontally in line with the vertical center or axis on which the needle turns, and on the opposite sides thereof, by which arrangement the opposite poles of the magnet or magnets are caused to act upon the needle to force it into the same direction. It also consists in in applying the so arranged magnet or magnets so as to make it or them adjustable on a center coinciding as nearly as practicable with the vertical axis on which the needle turns, that their poles may be made to point in any direction necessary to compensate for the local attraction, and may have their direction varied to meet any point or points of local attraction that may be produced by different cargoes or other causes. It further consists in providing for the adjustment of the so arranged and applied magnets in a direction parallel with the axis or vertical center on which the needle works, for the purpose of increasing or diminishing the intensity of their action according to the intensity of local attraction. Patents have also been obtained in England, France, and Belgium.

Tarring Rope Yarn.

John Stewart, of Brooklyn, N. Y., has invented an improved machine for tarring rope yarn, and assigned the invention to Charles Wall, 220 Front st., New York. The improvement consists in the employment within the tar vat of one or more series of sheaves or conductors, around which the yarns are bent in their passage through the tar, and by which they are conducted in such a manner as to cause them to pass through the tar in opposite directions, whereby they are caused to be more perfectly penetrated by the tar, and to keep the tar well stirred. The claim will be found on another page, as it was patented this week.

Knitting Machine.

F. Schott, of Brooklyn, N. Y., has invented an improved knitting machine, which has principally for its object the production of stockings and other knitted fabrics of a closer or more compact texture than those ordinarily produced by machinery. It consists in a series of improvements in those kinds of straight knitting machines in which the needle bed has a movement back and forth, to present the needles, one or more at a time, in regular succession into an operative relation with one or more feeders or thread conductors, and a corresponding number of stitch hooks. The claims will be seen on referring to our list this week.

Improved Sash-Fastener.

John Bestwick, Jr., of Dedham, Mass., has invented an improved sash-fastener, which consists of an eccentric or cam provided with a spring fitted within a proper box or case, and used in connection with a spring bolt. These parts are placed in the side strip of the sash, and the eccentric and spring bolt are in such relation to each other that the lowered sash will not only be retained at any desired hight, but also locked when down or closed, and the spring bolt drawn back by actuating the eccentric. The invention was patented this week, and the claim will be found on another page.

WE are indebted to Hon. John Cochrane, Member of Congress for this city, for many Congressional favors, and especially for copies of the Annual Report of the Commissioner of Patents.

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New Inventions.

Solid Ink.

M. Leonardhi, of Dresden, has invented an ink which he can form into cakes for convenience of transport. The inventor takes forty-two parts of Aleppo galls, and three parts of Dutch madder, and infuses them in a sufficient quantity of hot water. The solution is then filtered, and five and a-half parts of sulphate of iron are dissolved in it, after which two parts of acetate of iron and one and one-fifth part of liquid sulphate of indigo are added. The whole is then evaporated to dryness, and the residuum molded into cakes. One part of this dry ink dissolved in six of hot water gives an ink of first-rate quality; but one of good quality may be obtained by adding even fifteen parts of hot water.

Improved Method of Heating Buildings.

William H. Churchman, of Janesville, Wis., has invented an improvement in the method of heating apartments, &c. The invention consists in arranging within the double walls of a furnace, placed in the basement or other suitable part of the building to be heated, a series of rarifying metallic drums, to which a moderate degree of heat is imparted, and causing these drums to communicate, by suitable pipes at the upper and lower parts, with venti-ducts or flues extending through the walls of the building to the respective apartments to be heated. These pipes and flues are so arranged as to produce a continuous draft of air from the apartments through the drums, and thence back again to the apartment in a heated state. By this means each apartment is treated as a distinct reservoir of air, and under all conditions of the weather the room is supplied with a mild and genial warmth, entirely free from dust, smoke or sulphurous gases. The claim will be found on another page.

Improved Felly Bending Macnine.

The old style of making fellies in half-a-dozen pieces by the laborious processes of axe and saw, is quickly going out of fashion, and bent fellies are rapidly taking their place; the bent felly has so many advantages, chiefly owing, perhaps, to the grain of the wood being, as it were, continuous, and passing in a circle around the wheel, thus adding a natural stability to the construction which the cut felly does not possess.

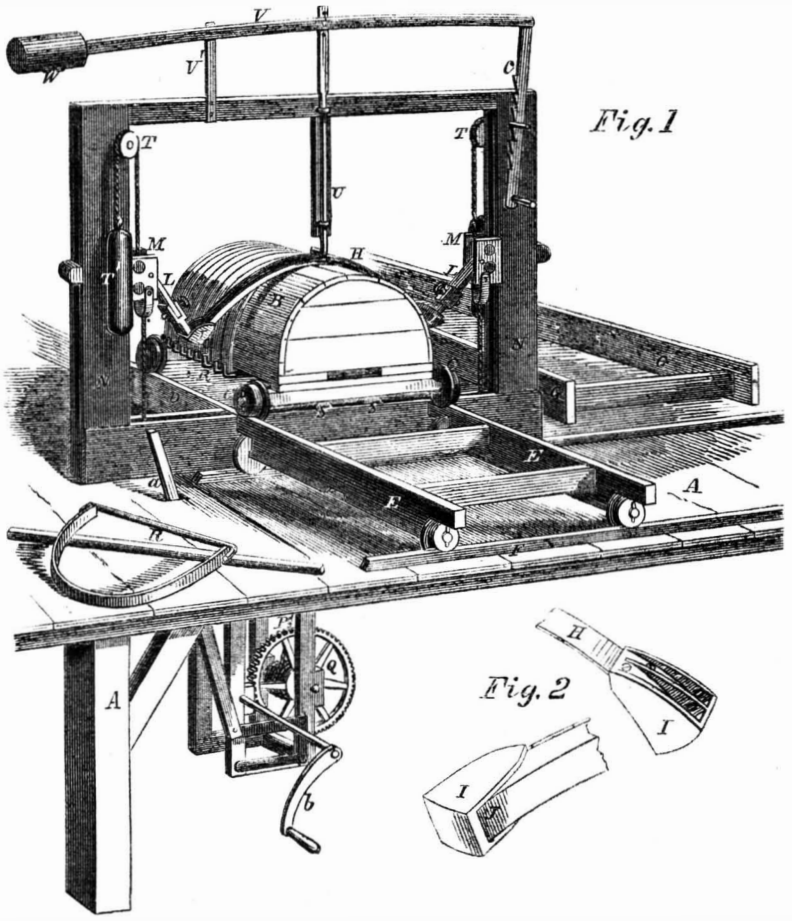
Mr. J. L. Mann, of Blandford, Mass., has invented an excellent machine for bending fellies, which prevents any breaking of the outer fibers of the wood, and bends by squeezing the fibers on the inner side closer together.

In our engravings, Fig. 1 shows the whole arrangement. A is the frame of the machine, B the mounted forming block, made in the shape of a half cylinder just the same radius as the wheels for which the fellies are intended. B is mounted on wheels, C, and can move to its position, or be moved away by the rails, D, or car, E, also moving on rails, F, to bring it in juxtaposition with the rails, G, on which, when full, it can be moved away.

The fellies are bent upon the forming block by means of a band of iron, H, in length equal to the length of the felly. A head, I, (seen detached in Fig. 2,) is fixed to each end of this band, having a seat, J, inside, that receives the ends of the unbent fellies. The heads, I I, are pressed downwards and inward by an arm, L, which articulate in moving fulcrums, M, that are guided in their upward and downward movement by posts, N, which receive between them a T-head from the fulcrum, M. When the moving fulcrums, M, are up, the arms, L, lie nearly vertical, the lower and divided rods fitting into the steps, *o o*, in the head, I (seen in Fig. 2). As the moving fulcrums descend, the arms, L, assume an inclined position (as seen in Fig. 1), and thus press the heads, I I, snugly to the sides of the forming block, with the felly inside of it. M is drawn downward by cords, P, which pass around friction rollers, S, and a windlass, Q, turned by a crank, *b*, and gearing.

The fellies when first bent are held in place upon the forming block by a gripe, R, which gripes the heads, I, and holds them close to the forming block, and so allows the former to be moved a little back, the windlass released by the lever, *a*, when the weights, T′, attached to cords passing over pullies, T, and connected with M, quickly bring them up to

MANN'S FELLY-BENDING MACHINE.

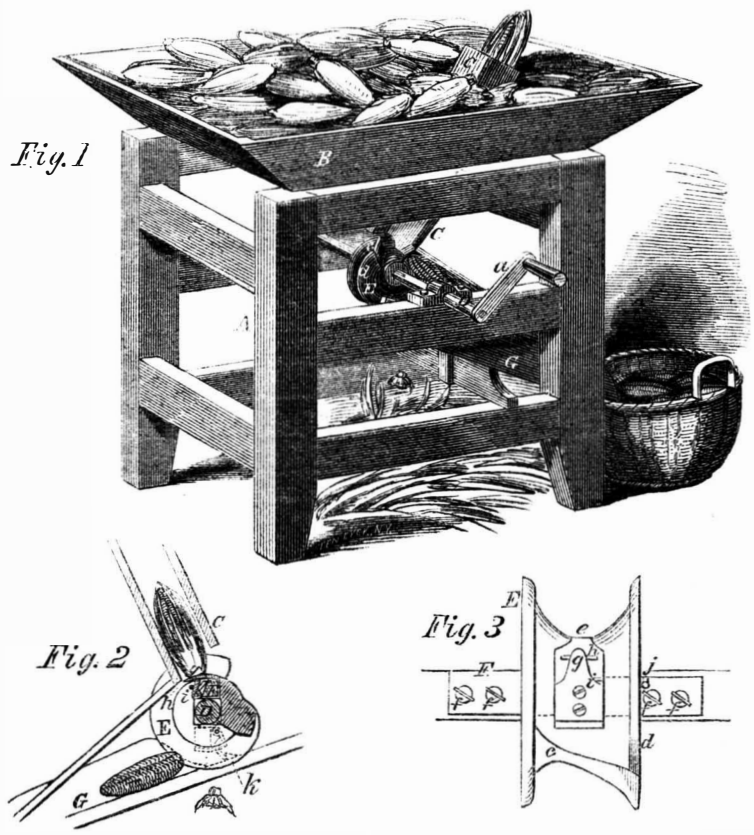


the top of N, ready for another felly to be bent.

The machine is used in the following manner:—The fellies are sawn or split, and cut square at the ends, just long enough to enter the seats, J, upon the inside of I, the band, H, being on the outside of the felly. The felly being thus prepared, is placed upon the mounted forming block, B, and the rod, U, brought down firmly upon it—as seen in Fig. 1. This rod is attached to a lever, V, whose fulcrum is at V′, whose long arm is provided with a toothed handle, *c*, by which it can be held firmly in place. The short arm is provided with a weight, W, that raises U as soon as *c* is is released. U holds the felly securely on the forming block while being bent.

It was patented August 31, 1856, and any further information can be had by addressing the inventor as above.

MEACHAM'S CORN HUSKER.



So great a feature of our agricultural community has corn-husking become, that in some States the period is made one of jollity and fun, so that the pleasant joke and ringing laugh may, in some measure, counteract the unpleasantness of the work; this is veritable wisdom. But it would be wiser still were the farmers to provide themselves with some good corn-husking machine, and do in a few hours what, by hand labor, would occupy many days.

The subject of our illustration is a corn-husking device, the invention of B. B. Meacham, of Ridlyville, Fla., and was patented by him May 25th, 1858. It is simple, and will be understood from the following description.

A represents a rectangular frame of wood or metal, supporting a hopper, B, having an inclined spout, C, projecting through the bottom of it. These parts are seen in the perspective view, Fig. 1. D is a shaft placed in the frame, A, and provided with a crank, *a*, or driving pulley, at one end. On the shaft, D, at about its center, a wheel, E, is placed—seen also in the vertical section of the cutting device, Fig. 2, and detached view, Fig. 3. This wheel is grooved circumferentially, and has an oblique partition ledge, *c*, extending across the groove, the wheel having also an opening, *d*, in its side, at one end of *c*. A smaller or narrower groove, *e*, is also made circumferentially in the wheel, E. A bar, F, passes transversely through E in a mortise, and is adjusted nearer to or further from the shaft, D, by set screws, *f*.

To the outer surface of F a knife or cutter, *g*, of pointed form, is attached; and a forked plate, *h*, attached to an arm, *i*, fits over the knife, the point of which projects through the fork. The arm, *i*, of *h*, passes through the side of the wheel, and its outer end is bent at right angles with its other part, as seen at *j*. G is an inclined trough or spout placed in A, the upper end of the trough being by the side of wheel E.

The operation is as follows:—The shaft, D, is rotated, and the ears of corn in the husk are placed one by one, butt foremost, in the spout, C. They fall down C, and their butts pass into the groove, *e*, in E, and as the knife or cutter, *g*, passes around, it cuts the butt from the ear directly at its junction with the ear, the knife being properly adjusted to effect this by adjusting the bar, F; and the knife also strips the husks from the ear, they adhering to the butt. The ear being deprived of its integuments, is, by means of the oblique partition or ledge, *c*, conveyed into the upper end of the trough or spout, G, from whence they fall directly into any proper receptacle prepared for them. The butt and husks which adhere to *g*, are forced therefrom by the forked plate, *h*, which is moved outward so as to strip the knife, in consequence of the outer bent portion, *j*, striking against a projection, *k*, on the trough or spout, G.

Thus it will be seen that the corn is quickly and completely husked, and the machine is very convenient and compact. The inventor will be happy to give any additional information upon being addressed as above.

Improved Refrigerator.

A. Lipmann, of this city, has invented an improved refrigerator, in which he arranges a series of coiled pipes, emanating from the sides of an ice chamber, in such a manner that they descend between the walls of the refrigerator, where they are surrounded by some non-conducting material; they are then connected at their lower ends with another coil, that extends through a central tube from top to bottom of the refrigerator, and back into the ice chamber. The cold air from this chamber is caused to descend through the first named series of coiled pipes, and to ascend and flow back through the central coil, and by this circulation of cold air, the temperature in the refrigerator may be brought to a very low degree with a comparatively small amount of ice. It was patented this week, and the claim will be seen in another portion of this paper.

Machine for Sawing Fellies.

This invention consists in the use of two or more band or annular saws, attached in a peculiar way, to the under side of a horizontal rotating wheel, and using in connection with this wheel an adjustable bed or platform, the whole being so arranged that fellies may be rapidly sawn from the bolt, and of varying sizes as required. The inventor is D. E. Butler, of Chesterfield, Ohio, and it was patented this week.

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Scientific American.

NEW YORK, DECEMBER 4, 1858.

Something about Science and Scientific Men.

Not long ago, the town of Leeds was, in English phrase, "honored" by the presence of Her Majesty, Queen Victoria, who opened the new Town Hall in brilliant style, and who honored herself by taking up her abode in the mansion of the celebrated mechanic, Sir P. Fairbairn, in that manufacturing place. The town of Leeds has more recently been exalted by the presence of the *savans* of Britain, at the annual meeting of the British Association for the Advancement of Science. It may be well for us, as a lesson to our association inaugurated for the same purpose, to say a few words on the extensive share of attention which the application of any scientific discovery to the useful arts of life, commerce, and popular knowledge receives from those gentlemen; and to do this it will only be necessary to mention the names of the chairmen of the various "sections." The president for the year was Professor Owen, perhaps the most eminent anatomist living, next to our own Agassiz; but he excels the latter *savant* in one important particular—he can write his knowledge, and speak it, too, in language the most beautiful, simple, and intelligible, so that even the most common mind can comprehend it; witness his numerous popular works, in the encyclopædias, the "Circle of the Sciences," and his popular lectures on paleontology and natural history, in London.

The Rev. Dr. Whewell presided over the mathematical section and physical science. He is well known as a progressive divine, and for his popular writings on the natural sciences. Of his working capabilities we can only say that, although Master of Trinity College, Cambridge, he is not dogmatically scholastic, but is a great and powerful advocate of popular education in Great Britain.

The chemical sciences received the attention of Sir J. F. W. Herschel, whose name need only to be mentioned to be appreciated, as one who has done much for the age in which we live.

Geology was cared for by William Hopkins, M. A., a gentleman whose geological knowledge is only equaled by the interest which he takes in practical mining; and the aid which this branch of art has received from his many suggestions is very great.

Physiology had for its chairman Sir Benjamin Brodie, an eminent surgeon, who carries his scientific knowledge into the truly humanistic field of his daily avocations.

Sir Roderick Murchison, Director of the School of Science Applied to Mining and the Arts, was president of the geographical and ethnological section; and should any instance of his work in the special fields of his investigation be needed, we can call to mind his work on "Siluria," and his munificient support of the Livingstone expedition into Central Africa.

Edward Baines, editor of the Leeds *Mercury*, a printer by trade, and a strong opposer of any governmental interference in moral or educational measures, was the chairman of the economic science and statistical section. His life has been passed as a practical reformer, and the liberal and friendly views he has of this country entitle him to our respect; while for the very objects which he has had under his consideration he is always working, and is a practical man eminently fitted for the position.

Mechanical science was looked after by William Fairbairn, whose investigations into the nature of cast iron, the strength of materials; and many machines are known wherever iron is worked. He is a member of the firm who have an immense machine shop in the town of Leeds, and he took good care to see that all the discussions had a useful tendency.

We hope the American Association for the Advancement of Science will look over these names, and remember that there are similar men to be found here, or if not, it should be their highest aim to develop them.

Not having space to take each section and its proceedings, we will give a *resumé* of Professor Owen's inaugural address, in which will be found a summary of what has been doing among the *savans* of Europe during the last twelve months.

The relation between magnetic storms and the spots on the sun has been fully demonstrated by the independent observations of a German astronomer and an English meteorologist; and the deductions made therefrom tend still further to show that electricity and magnetism are but different effects of the same cause. From this the president referred to nerve force, which he said might prove also to be connected with electricity; and as we had produced "valerianic acid," and other compounds generally attributed to the action of vital force solely, by chemical means, he saw no end to the application of these investigations; and in time we might supersede the slow processes of nature "by laying under contribution the accumulated forces of past ages, which would thus enable us to obtain in a small manufactory, and in a few days, effects which can be realized from present natural agencies only when they are exerted upon vast areas of land, and though considerable periods of time."

The rapid advance of photography was next mentioned; and the wondrous engraving upon metal by light, and photographic printing in carbon (two recent discoveries), were announced. The Atlantic Telegraph was introduced as the climax of Œrsted's discoveries, and in the after-part of the meetings much discussion took place concerning the cause of its stoppage; but it seemed to be generally allowed that more investigation was necessary before any definite opinion could be pronounced.

Much has also been done during the past year to fix isothermal lines with greater accuracy, the parallels of the indigene plants and animals, and to obtain a more perfect knowledge of climatology. The zones of life in the ocean (of vast importance to the fisheries) has also been studied, with a view of fixing the depths between which the various genera of marine life exist. From the dreadful losses by "plague, pestilence, and famine" which the armies suffered in the Crimea, much has been learned of value to sanitary science; and the condition of the river Thames has called philosophers' attention once more to the economizing of the waste sewage of towns as manure. Agriculture has considerably advanced, substituting useful machines for hand labor; and although the Professor did not pay us the compliment, yet we cannot help feeling that the United States has done her full share in that work. Geology is daily teaching us more of the nature of soils and their constituents; and we should quickly endeavor to lay hold of and improve the knowledge we possess.

After reviewing the good done by the British Museum, Kew Gardens, and other museums and places of popular instruction, the first meeting closed, and the sections fell to their separate labors, the results of which will appear from time to time in the SCIENTIFIC AMERICAN, as we can find space for such paragraphs as may interest our readers.

We cannot conclude without asking why have we not museums like the British, botanical gardens like Kew, and a zoological collection like that in Regent's Park, London, or the Jardin des Plants, Paris, with men of the same caliber, having the same interest in the spread of popular knowledge as those, and an association like the above on these shores? And echo replies, "Why not?" With a firm conviction of its truth, we believe there is enough money stolen and squandered upon foolish schemes in this city in one year, to establish here a zoological garden, and in every five years a museum of giant proportions—the center of vast interest and profit to all our people. Why cannot the citizens of New York—the most wealthy commercial city in America—do something in this very department to still further invite the stranger to visit their city? Surely the present state of indifference on subjects of a scientific and esthetical nature ought no longer to exist.

Are Coal Oils Explosive?—Adulterations.

An intelligent correspondent informs us that he has recently witnessed the violent explosion of a gas lamp in which coal oil was used, and he says that "as it is generally supposed to be free from liability to explosion, if adulteration by means of other dangerous burning fluids is resorted to, the means of detecting it ought to be generally known." The inquiry is a very important one, as oils bearing this designation are now very extensively consumed, and their manufacture has become one of the most extensive in our country. It is also a question of personal safety, and it is therefore of great consequence that all possible light should be shed upon the subject.

Pure coal oils are not—strictly speaking—explosive, because they are only sub-spirituous, and stand mid-way between the fixed and volatile oils. They are, however, (like camphene) capable of intimate mixture with alcohol, and if adulterated with it, they become like the common *burning fluids*, which have caused so many dreadful explosions.

We will here state, as a scientific fact, that none of the burning fluids will explode while in a fluid state; they must first be converted into gas and then mixed with about eight volumes of the atmosphere, so as to become saturated with oxygen, before they will explode instantaneously. As alcohol contains a great amount of hydrogen, which is the lightest of gases, it is very susceptible of assuming the gaseous condition; hence the danger of mixing coal or other oils with it. We have been credibly informed that some coal oils which are sold for the genuine article, are adulterated with alcohol; hence some lamp explosions may have ensued in the use of these. So far, however, as our personal knowledge extends, we know of no such accidents.

Most of the lamps which have recently been invented for burning coal oil, and volatile burning fluids, are perfectly safe in the charge of careful persons; we therefore advise all those who use coal oils,—since they cannot tell whether they are adulterated or not—to exercise the utmost caution in filling their lamps, and in having them made strong and tight, and they will be sure to avoid explosions.

Enquiries have also been made of us in regard to the means of detecting adulterations in coal oils, and some of our correspondents intimate that turpentine and resin oil as well as alcohol, are employed for this purpose. It is our opinion this is not the case, because the turpentine and resin oil would greatly increase the tendency to become smoky—the very evil which we desire to avoid. Alcohol does obviate this evil; and were it not so volatile, it would be a valuable agent in artificial illumination. We are not acquainted with any test for detecting turpentine or rosin oils, if mixed with those of coal, There is such a variety of the latter that no test has yet been adopted for determining their purity, because we have as yet no fixed standard for them; and neither their smell nor color are positive indications of their qualities. The test for alcohol, in what are called "essential volatile oils," is the chloride of calcium, which may answer equally well for coal oils that contain no benzole. The way to use it is to place a small piece of the chloride of calcium in a test tube containing the oil, and to agitate it gently for a short period of time. If it contains alcohol, the calcium will dissolve in the fluid; if not, it will remain in its solid condition. As some chemists engaged in the distillation of coal oils assert that alcohol also comes off from the coal in vapor, with some benzole; of course, the above test is of no value if this fluid is combined with such oils. This is a question of a very complicated character, as the coal oils are a comparatively new manufacture, and there is doubtless much general ignorance reigning both among men of science and others in relation to them. There is here a wide field open for critical experiments by chemists who have time, means, and a good apparatus to conduct them, and we earnestly invite their attention to this subject.

Another Important Step in Science.

The Commonwealth Manufacturing Company, of this city, have shown us a new and very beautiful barometer, the invention of Mr. T. R. Timby, of this city, who has succeeded in rendering this instrument perfectly portable, (which we believe is the only one since the first conception of the barometer by Torricelli, a pupil of the celebrated Galileo more than two centuries ago,) and to demonstrate the practicability of his discovery Mr. Timby made his barometer his travelling companion in Europe, and finally expressed it from Paris to New York, without the slightest injury. This we regard as a practical demonstration of its portability, and we bespeak for it a speedy and universal adoption, especially among agriculturists, they more than any other class (save the mariners), need the counsel of this faithful monitor which leaves nothing to conjecture, but tells with promptness of the coming storm long before a threatening is visible in the sky. We are told that the above named company are now making this instrument upon a magnificent scale, and for a price that places them within the reach of the million.

Crompton's Loom for Fancy Weaving.

On the 25th of November, 1837, a patent was issued to William Crompton for a loom for weaving fancy and figured fabrics; it was afterwards extended for seven years by the Commissioner of Patents. In consideration of its value, and of the fact that Crompton was insane during a considerable portion of the term of the patent, his conservator, Edson Fessenden, applied to Congress for an "act of relief," in the shape of an extension of the patent. It elicited an interesting discussion in the Senate during its last session, a brief of which was published on page 317, last Vol., SCIENTIFIC AMERICAN, and the bill was passed, but it failed to come up in the House, therefore the Crompton loom is now public property.

The Atlantic Cable.

We have received a vast number of communications within the past few weeks in reference to the Atlantic Cable, and would gladly give place to them, if the suggestions were new and practically important at this time; but the public mind wants some rest on this subject, and we are disposed to favor this reasonable desire. By the last foreign mail we learn that the company had refused to allow Professor Whitehouse to carry on any more experiments, and had dismissed the electric staff connected with the cable at Valentia, and closed the premises. It would thus seem that the cable was pretty much "played out" in the opinion of its directors.

An interesting communication will be found on the next page from Messrs. Winans, of Baltimore, Md., defining the theories involved in the construction of their novel steamer, illustrated in No. 9 of our present volume. The length of the article should not deter our intelligent readers from giving it a careful perusal. In our next number we shall give some attention to this subject, not having the space to do so in this issue.

Our readers will bear in mind that the date given at the head of the "Patent Claims," as they are published weekly, corresponds to the exact date of the issue of the patent.

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Winans' New Steamer—Interesting Statement of the Builders.

MESSRS. EDITORS:—We observe that, in noticing our plan of steamer in the SCIENTIFIC AMERICAN, you append some remarks in relation to the probable result of the experiment which we are about to make, and that you have discovered many objections and no virtues connected therewith, in which one-sidedness of opinion put forth to the public (so far as we are aware) you stand alone. We take no exception to anything you have said in relation to the probable result; but, on the other hand, we deem it not only proper but a duty which a paper like yours, professing to be the true exponent of the mechanical sciences, owes to its patrons, to discuss such subjects as they come up, in advance of actual trial, with a view to ascertaining how their solutions as determined antecedently by science, deduction, and reasoning, correspond with those solutions subsequently determined by actual practice. We shall therefore be pleased to have you further discuss this matter in the SCIENTIFIC AMERICAN, and to give your views freely and fully. Hoping that you will do so, we will mention some of the prominent objections that have been made to our plan of steamer by scientific and practical men, and give you our views in relation to these objections as well as those made by yourselves:—

Objection 1.—"It is without sails, so that if any accident occurs to the machinery, it must lie a helpless log upon the waves."

To this we answer that the propelling wheel is driven by four distinct engines, any one of which is, as we believe, capable of driving the vessel ten miles per hour. These engines are supplied with steam by two separate boilers, situated in different ends of the vessel. Two of the four engines are coupled on to one end of the propelling shaft and two of them on the other; so that one or more of the engines can be detached without interfering with the working of the others. Further: the arrangement is such that, if the crank pin or journal of the shaft should give way on one end, the vessel can be propelled with good effect by the engines which gear on to the other end. The propelling wheel is better shielded from injury than either the ordinary screw-propeller or the side paddle-wheel, and is, from its make, less liable to damage. The propelling wheel shaft is, from its shortness, compactness, and the smaller strain to which it is subjected in proportion to the power exerted, less liable to injury than the shaft of either of the ordinary propelling wheels above mentioned. The vessel has two rudders, either of which will steer it well. Hence, we believe that the chances of our vessel becoming so deranged as to leave it without steam propelling power or steering apparatus are two or three-fold in its favor as compared with ordinary steam vessels. But should it be left without steam power, then, and not before, will sails make their appearance externally on the vessel, sufficient to keep steerage and headway on it; the smoke-pipes answering the purpose of masts to rig the sails upon. Such has been our plan, and such will be the arrangement; but if, by possibility, our vessel should be left without any propelling power, and "lie a helpless log upon the waves," we believe it will be very much safer in such condition than it would be if constructed on any other plan of sea-going steamer now in use, and also less liable to remain in such condition.

Objection 2.—"However strongly its parts may be secured together, its shape is an unstable one."

We presume this means that it is unstable because the outline of the cross section of each and every part of the vessel is a circle. Now, we believe that our vessel, because of its circular form, when used in combination with the low position of the machinery, anchors, chains, and other necessary appendages, and when propelled by steam power only, will have much less side motion or rolling on its longitudinal axis in a rough sea than any sea-steamer now in use. Vessels carrying sails and other ordinary appendages obtain staunchness by deviating from a circular immersed cross section; the stability gained in this way acts in conjunction with the ballast and loading of the vessel to furnish the necessary fulcrum for the moving power of sails, acting as it does, many times the breadth of the vessel above the resistance to be overcome. To a vessel having the ordinary spread of canvas in proportion to tunnage, this resorting to shape in aid of ballast and load to furnish the fulcrum above mentioned is perhaps indispensable, but not so in a vessel propelled wholly by steam as our is; in the latter case the power, instead of being applied high above the water or point of resistance, is applied directly on a line with the resistance to the motion of the vessel; the ballast furnished (as before stated) by the machinery, &c. of our vessel being amply sufficient to give it greater freedom from rocking than usual, and especially when taken in connection with the peculiar position of our rudders, which are "balance rudders," two in number, projecting with their entire surface below the bottom of the vessel, and thus acting with great efficiency to prevent accumulation of rolling or oscillation; and also when taken in connection with the numerous radial wings or vanes connecting the body of the vessel to the outer sleeve, which wings form channels parallel to the motion of the vessel, through which a large bulk and weight of water is constantly passing with great rapidity when the vessel is in motion; thus powerfully resisting any tendency to rocking or oscillation. The shape which is usually adopted, to aid the ballast in giving stability to sailing vessels, acts well and in harmony with the ballast when the surface of the water is level or nearly so; but it is far from acting well in assisting to keep the deck of a vessel level when the surface of the sea is quite rough. The more the shape of the vessel produces resistance to being careened or rocked sideways, to and fro, on smooth water, the greater is the power of the waves when the water is rough to rock it sideways, back and forth. Such is not the case in relation to the resistance to side-rocking obtained by ballast placed low down in the vessel, for this resistance is constant and uniform in its action for good, whether the water be rough or smooth; therefore, for a sea-going vessel designed to be propelled by steam alone, it is decidedly best to depend exclusively upon ballast for stability, and to make the vessel perfectly round throughout its cross section, which shape more perfectly than any other disarms the waves and rough water of their power of disturbing that position which the ballast of the vessel constantly tends to maintain.

Objection 3.—"Theory and practice have demonstrated that the 'wave-line' system is the true one on which to construct vessels that are to cleave the waters with *safe* rapidity, but this boat does not admit of these lines."

If our vessel were a solid instead of being a a hollow spindle, and all the material in it so arranged—without moving any of it backwards or forwards—as to make the bottom and top lines straight and parallel with each other, it would produce a much more perfect form of "wave-line" vessel than is to be found in present use. The side lines would be composed of reversed curves giving the hollow bow and stern and swelling middle. But we are persuaded that, when the solid spindle was in the form of "wave-line" just described, it would meet with greater resistance in passing through the water than when in its present shape, for the reason that more surface would be presented to the water, and the water would move out of the way of the vessel and fall in behind it by lines less easy and short than will be the case with the form we have adopted.

Objection 4.—"The long and narrow ships have been found to roll almost too much as it is; what then may be expected from a ship much narrower in proportion than any ship now built, and which is so shaped as to sail equally well in any position?"

The increased length being about 50 per cent, you will probably insist that the increased tendency to roll will be 50 per cent also. If you should be right in this, we feel persuaded that the round form of our vessel (for the reason before given) will more than counteract this increased tendency to roll, and that, under all contingencies, our vessel will roll less than ordinary sea-going steamers do. But our views with regard to increased tendency to roll, caused by the greater length you mention, when applied to our plan of steamer, are exactly the reverse of yours. We believe that, while the breadth of beam of our vessel remains the same, the greater the length (the ballast being increased in proportion to increased tunnage) the less the tendency to roll sideways, or to undulate endways; the reason for this is that the increased surface presented to the water and the greater *vis-inertiæ* of the mass both increase the resistance to rolling, and these resistances and each of their parts act constantly in conjunction and harmony with each other. Such harmony of action is not the case with the forces that tend to cause this rocking motion. The force coming from the undulatory surface of water in rough weather (and this is the chief force with our plan of vessel) not only loses harmony of action as the vessel is increased in length, but one portion of such force counteracts the other portion all the better as the length of the vessel is increased. Our reasoning is assisted in this by imagining a vessel built on our plan, of 16 feet beam and *several miles* in length. The numerous waves that would be constantly acting in opposition to each other, and the shortness of the time that any one or more waves would be left free to exert a rocking influence unopposed by the counteracting influence of other waves of equal or nearly equal energy, would be such that very little rocking would take place, even if the sea were ever so rough. If you say that this does not represent the case agreeably to your meaning, and that to do so, the comparison must be between vessels of equal tunnage, and consequently that, as the length is increased, the breadth of beam must be diminished, so as to preserve the tunnage equal; then, to meet this view of the subject, we will suppose two vessels of 4,000 tuns burden each, built and propelled on our plan, one of them being 300 and the other 600 feet in length. We believe that the longer and narrower vessel will have less objectionable motion, when all the rocking and undulations are taken into the aggregate, than the vessel with the broader beam and half length; because the double length, upon the principles before stated, will be of important advantage in diminishing side-rocking, and will also materially diminish longitudinal undulations.

Again, we will suppose two vessels of our plan and mode of propulsion, both being 500 feet in length, one of them being 20 and the other 40 feet in diameter, both being without smoke-stack, ventilator, and hand-railing, and the center of gravity of each being equally low down in proportion to their diameter; in this case the rocking of the narrow vessel would be no greater than that of the other; for the reason that the force and the lever by which it acts to rock the vessel, and the force and the lever by which it acts to resist the rocking, are at least as favorable, upon an average, to the small vessel as to the large one. In practice, the vessel of smaller diameter may require higher smoke-stacks and ventilators in proportion to diameter, and thereby slightly increase the leverage by which the wind tends to rock the vessel by its action upon them. In this way the narrower vessel may suffer a slight but scarcely appreciable disadvantage as compared with the vessel of larger diameter; but when compared with the ordinary sea-going steamers, a decided advantage will be had by our plan of vessel.

Objection 5.—"Iron ships are now constructed, and the use of this material, and the construction of ships in compartments, on which Messrs. Winans lay so much stress, is, as perhaps our readers are aware, not novel."

We are not aware that any ships have been constructed *entirely* of iron, as is the case with ours. Heretofore, iron ships, like most brick houses, have had so much wood used in their construction, independent of their cargo, as to render them destructible by fire. Not so with our vessel, the plan of which peculiarly adapts it to be constructed entirely of iron. We believe ourselves to be the first to construct a vessel positively fire-proof; that the plan of our vessel is peculiarly adapted to the use of secure and numerous water-tight bulkheads; and that our steamer is the first intended and so arranged as to carry passengers apart from a combustible cargo, (except the mail and such other small articles as can be put into iron air-tight cases or compartments,) and to thus render the burning of the vessel at sea quite impossible. We do not think we have laid too much stress on the importance of doing this. We are not aware that we have said or written anything to warrant the conclusion which you appear to have arrived at, to wit: that we claim, as a novelty, the use of iron in the hulls of ships, or the use of water-tight bulkheads in ships.

Objection 6.—"On the whole, looking at past experience in shipbuilding, we have no hesitation in saying that the 'cigar build' will prove no success, and that the experimental one will most likely be the last."

To this sweeping objection we shall at present only say we differ with you in opinion, and hope that you will publish, at greater length, your reasons in support of such conclusions, together with our own views and reasonings herein set forth.

It has been said, further, that our vessel will bury itself so deep in the water, when running at full speed, as to be rendered impracticable from this cause alone. What are your views with regard to this assertion, and also as to the speed which our vessel will be able to maintain in smooth as well as rough water? Each of the four cylinders is 24 inches in diameter and 26-inch stroke; and each of the two boilers has about 1,500 superficial feet of fire surface and 40 feet of fire-grate; the fire in the furnaces is to be urged by exhausting the steam from the cylinders up the chimney, after the plan of locomotive engines; the pressure of steam is to be 100 pounds, and a variable cut-off; the vessel is 180 feet long, 16 feet beam, and 350 tuns displacement of water.

In our circular we also gave our ideas as to the advantage of our plan of propeller; we would be pleased to have your views on this subject also. If your views of our plan of vessel shall prove to be correct, it will result in an increased confidence in the public mind in your teachings on such subjects.

ROSS WINANS.
THOMAS WINANS.

Baltimore, Md., Nov., 1858.

Useful Composition.

A composition has been patented in London, for manufacturing molded articles from a mixture of the asphaltum of tar and fine brick dust. This asphaltum is the residue left in the retorts in distilling gas tar to obtain naphtha; it is kneaded with one part of brick dust, and then molded into the desired form for picture frames, or any other article desired. From such cheap materials it is thought that a composition may be made which can be vulcanized, and from which articles like canes and combs, may be manufactured. In Paris a compound of albumen and sawdust is proposed for the manufacture of various molded articles. Pure albumen, obtained either from eggs or blood, is slightly diluted with water, and in this fine sawdust is soaked; it is then submitted to severe pressure in a press, after which it is forced into metal molds, which should be kept heated during the process of fabrication. As soon as the molding is completed, the mold is plunged in cold water, to cool the articles.

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Notes and Queries

*** Persons who write to us, expecting replies through this column, and those who may desire to make contributions to it of brief interesting facts, must always observe the strict rule, viz., to furnish their names, otherwise we cannot place confidence in their communications.

W. K., of Ill.—You will find a similar theory to that set forth in your communication on page 163, Vol. VIII., Scientific American. It may be called "the electric theory."

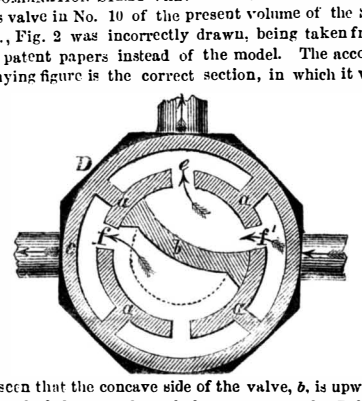
R. C., of Ohio.—We would not advise you to use gun cotton for pistol or rifle shooting. We have never seen explosive sawdust, but no doubt it can be manufactured as easily as gun cotton or paper. Gun cotton is made by saturating clean cotton in equal quantities of nitric and sulphuric acids; the former of 1.50 specific gravity, the latter 1.80. Squeeze out the acid when the cotton is saturated; wash in clean soft water until the acid taste is removed, then dry it for use.

J. J., of N. Y.—The law by which the length of pendulums is regulated to obtain a certain number of beats per second is as follows:—"The times of vibration of different pendulums are in the same proportions as the square roots of their centers of oscillation from the axes of their suspension." A pendulum 39.1393 inches vibrates seconds in a vacuum at the level of the sea in London. There is no rule for the weight or "bob" of pendulums; they are made of such a size as is deemed best for overcoming resistance.

S. L., of Pa.—You will find in "Appleton's New American Encyclopædia" some information upon the subject of aluminum. Your lamp seems to be new.

Gulf Stream.—Our readers will remember an interesting article on this subject in No. 3 of this volume, which is credited to G. W. F. "Mullen." The author objects to this cognomen, and wishes to be known by his true name which is Mellen. We should object to being called "Mullen" ourselves, for we have it upon the authority of an able lexicographer that it is a plant of the genus *Verbascum*, growing in neglected fields.

Combination Steam Valve.—In our illustration of this valve in No. 10 of the present volume of the Sci. Am., Fig. 2 was incorrectly drawn, being taken from the patent papers instead of the model. The accompanying figure is the correct section, in which it will



be seen that the concave side of the valve, *b*, is upward instead of downward, as before represented. Rob rt Stewart or J. L. Gibson, of Elmira, N. Y., will both furnish any information concerning this useful and economic valve.

S. H. W., of Maine.—You may safely trust Webster's Dictionary for a correct definition of "sound."

Soluble Glass.—Many persons are writing to us to know where this article can be obtained. If they will refer to the advertising columns in the same number of the paper which contained the communication, the question will be answered.

J. W. S., of Cincinnati.—When you bring in your model we can tell you the exact cost of an engraving. We are pleased to know that you are well satisfied with our agency in securing your patent. Our facilities in this business cannot be excelled.

Coal Oil.—There is an unusual interest manifested on the subject of coal oil just now. We were informed a few days ago, by one of the most extensive oil-dealers in this city, that he could sell thousands of gallons more than he was able to supply, so great is the demand. Several parties have applied to us recently in reference to engaging in the business, and we are now able to refer them to a reliable party who can give all the details, both of machinery and the processes. We refer to Mr. J. E. Holmes, whose advertisement appears in another column. He is well known to the readers of this journal, and has contributed from time to time much useful information to its columns.

E. C., of N. Y.—A locomotive has been employed on some of the canals in England for hauling, in place of horses on the tow-path.

S. A., of Mich.—We are glad you can speak so highly of the Sci. Am., and that you will send us all the subscriptions possible. You can get sewing machine needles made to order by A. Piernot, 113 Elm st., this city. In reference to the Grover & Baker stitch, we would state that it is not patented, but their claim is for the means of producing it.

C. M. D., of Cal.—Bourne's Catechism of the Steam Engine, and Hughes' American Miller will be useful works for you, although not so thorough and complete as you seem to require. You cannot get exactly what you want. Send your order to Henry C. Baird, of Philadelphia.

O. S., of Ohio.—We have sent you one of our circulars of advice. Please send us a sketch and description of your device to be employed in connection with circular saw mills, for examination.

F. G., of Cincinnati.—It makes no difference to us whether you write your letters in English, French, or German; it is all the same. Write plain.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, November 27, 1858:—

B. I., of Ill., $25; F. M. D., of Wis., $30; C. B. P., of Ill., $25; M. C. C., of N. Y., $30; D. G., of N. Y., $30; S. & W., of Ill., $30; J. B. S., of Ky., $30; J. M. McD., of ——, $30; C. B. R., of Conn., $25; T. & S., of N. Y., $25; S. R. C., of Wis., $60; T. W. B., of N. Y., $200; G. D. H., of Mass., $25; D. W., of Mass., $30; J. B. W., of N. J., $30; J. G. W., of N. Y., $30; H. A. D., of Pa., $30; J. A., of Ill., $30; H. T. C., of N. C., $25; J. B. S., of Texas, $10; T. & W., of N. Y., $30; J. O'H., of Pa., $24; N. P., of Ind., $15; W. M. B., of Ind., $25; L. T., of Vt., $25; L. R. S., of Mich., $15; J. H. B., of Ohio, $30; J. D., of Mass., $250; P. B., of N. Y., $30; S. B. & I. M. F., of Ill., $30; S. O. V., of Ill., $35; F. D., of N. Y., $30.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Nov. 27, 1858:—

S. R. C., of Wis.; L. R. S., of Mich.; N. P., of Mo.; H. T. C., of N. C; L. T., of Vt.: J. O'H., of Pa.; W. M. B., of Ind.; J. W. R., of N. Y.; W. S., of N. J.; G. D. H., of Mass.; J. F., of Ky.; A. H., of N. Y.: E. S., of Texas; H. G. D., of N. Y.; T. & S., of N. Y.; B. J., of Ill.; C. B. R., of Conn.; G. W. F., of Mass.; O. S., of N. Y., (two cases); T. T., of Ohio; D. W., of Mass.; G. S., of Ill.; C. A. B., of N. Y.; N. D., of N. J.; J. L. W., of N. Y.: J. S., of Pa.; R. G., of Md.

A WORD TO OUR PATRONS.

Will our Friends Favor Us?—Any of our readers who do not preserve files of our paper for binding (we hope there are but few such), and who have Nos. 4 and 5 of the present volume which they are willing to spare, will oblige the publishers by sending said numbers to this office. Ten cents for each copy will be paid.

Back Numbers of the present volume of the Scientific American will be supplied to new subscribers when desired, with the exception of Nos. 4 and 5.

Literary Notices.

The Atlantic Monthly. Boston: Phillips, Sampson & Co. The "Autocrat" gives a farewell breakfast this month, and introduces his friend the Professor, who is to step into his lively shoes next month. There is also an entertaining article on "Punch"—not the compound—but the periodical, highly flattering to his obese majesty. The magazine is rapidly improving, with one slight exception, and that is, too many continued stories are being introduced.

The Democratic Age. Edited by C. Edwards Lester. New York: No. 41 Park Row. The second number of this magazine has just come to hand, and we find it full of lively, sparkling articles, and manly, vigorous thought. The biographical sketches are well written and correct. It seems to be making a position for itself very fast.

The Printer. New York: Henry & Huntington, 1 Spruce street.—This splendid specimen of typography has attained its seventh number, and it gradually increases in the interest of its contents. Every printer should be on the subscription list, the price being only one dollar a year.

IMPORTANT TO INVENTORS.

AMERICAN AND FOREIGN PATENT SOLICITORS.—Messrs. MUNN & CO., Proprietors of the Scientific American, continue to procure patents for inventors in the United States and all foreign countries on the most liberal terms. Our experience is of thirteen years' standing, and our facilities are unequaled by any other agency in the world. The long experience we have had in preparing specifications and drawings has rendered us perfectly conversant with the mode of doing business at the United States Patent Office, and with most of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

Consultation may be had with the firm, between nine and four o'clock, daily, at their principal office, 128 Fulton street, New York. We established, over a year ago, a Branch Office in the City of Washington, on the corner of F and Seventh streets, opposite the United States Patent Office. This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it. Inventors and others who may visit Washington, having business at the Patent Office, are cordially invited to call at our office.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

We are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business we have offices at Nos. 66 Chancery Lane, London; 29 Boulevard St Martin, Paris; and 26 Rue des Eperonniers, Brussels. We think we may safely say that three-fourths of all the European patents secured to American citizens are procured through our Agency.

Circulars of information concerning the proper course to be pursued in obtaining patents through our Agency, the requirements of the Patent Office, &c., may be had gratis upon application at the principal office or either of the branches.

The annexed letter from the late Commissioner of Patents we commend to the perusal of all persons interested in obtaining patents:—

Messrs. Munn & Co.—I take pleasure in stating that while I held the office of Commissioner of Patents, more than one-fourth of all the business of the office came through your hands. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill, and fidelity to the interests of your employers.

Yours, very truly. CHAS. MASON.

Communications and remittances should be addressed to MUNN & COMPANY,
No. 128 Fulton street, New York.

Zur Beachtung für Erfinder.

Erfinder, welche nicht mit der englischen Sprache bekannt sind, können ihre Mittheilungen in der deutschen Sprache machen. Skizzen von Erfindungen mit kurzen, deutlich geschriebenen Beschreibungen beliebe man zu addressiren an

Munn & Co.,
128 Fulton Str., New-York.

Auf der Office wird deutsch gesprochen.

A MESSIEURS LES INVENTEURS—Avis Important.—Les inventeurs non familiers avec la langue Anglaise, et qui prefereraient nous communiquer leurs inventions en Francais, peuvent nous addresser dans leur langue natale. Envoyez nous un dessin et une description concise pour notre examen. Toutes communications seront recues en confidence.

MUNN & CO. Scientific American Office, 128 Fulton Street, New York.

STEAM ENGINE FOR SALE AT A LOW PRICE—20-inch cylinder, 4 feet stroke. In good order, and now running; built by the Novelty Works Can be seen by applying to JOHN JEWETT & SONS, No. 182 Front st., New York. 1*

THE RIDGING PRAIRIE PLOW, FOUR feet wide, plows and plants new or old cleared land at less than half the usual cost. Rights for sale, or licenses granted by LUTHER ROBINSON, Boston, Mass. 13 2*

HOWE'S WEIGHING SCALES—STRONG & ROSS' PATENT. Having received first-class premiums from the Vermont State Fair, New York State Fair, Virginia State Central Fair, United States Fair, Virginia State Fair, and Franklin Institute Fair, within sixty days, we have now only to invite the public to examine our large stock of scales of every variety, and also to test the principle of a six-ton scale, set up on the floor of our store, as well as to examine certificates of their superiority from many of our leading houses. FRANK E. HOWE,
No. 438 Broome st., first door from Broadway, New York.
13 13* JOHN HOWE, JR., Brandon, Vt.

THE COMMONWEALTH MANUFACTURING CO., No. 110 Broadway, New York, are manufacturing the only Portable Mercurial Barometer in the world, the price and construction of which places them within the reach of every farmer, and with very little effort they may be placed in the hands of every agriculturalist; also in the hands of the merchant, mechanic, scientific and professional man. And to accomplish this end, they are establishing agencies for the sale of this instrument in every part of the United States, Canada and Europe. You will find, by an investigation of our business, that an exclusive agency for the sale of the Barometer in your town will furnish a lucrative and an agreeable interest. Agencies can be obtained by writing, also a sample can be obtained by enclosing us $10. A liberal discount will be made to agents. Address,
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INGOT COPPER, SPELTER, BANCA TIN, Lead, Antimony, Babbitt Metal, Mount Hope Cut Nails, Ames' Shovels and Spades, for sale by JOHN W. QUINCY & CO., No. 98 William st., New York. 13 e5w tf

COAL OIL AND RETORTS—THE UNDERsigned offers his services as an Engineer and Expert relating to machinery and processes in the above business. Terms moderate.
JOSEPH E. HOLMES,
13 10* Newark, Ohio.

FOR SALE—STATE RIGHTS OF ROBINSON'S recently-patented improved Springs, which supersede the wire springs used by upholsterers in chairs, sofas, carriage and railroad car seats, &c. Apply or address D. H. SOUTHWICK, 61 Chambers st., rear office, New York. 1*

$500. WANTED—AN ENTERPRISING young man to purchase half of a valuable Patent Winch for hoisting sails and cargo; adapted to every class of vessels. Address Box 87, Brooklyn, N. Y. 13 2*

WANTED—A SITUATION BY A PRACTICAL Draughtsman. Having for the last number of years been engaged in this capacity in one of the largest locomotive establishments, he would like to have a similar situation, with the intention of joining in partnership and investing capital in a year or two. Best references given. Address I. K. KNOW, Draughtsman, Box 3,028, New York. 1*

SOLUBLE GLASS—TO BUILDERS, ROOFers, Masons, and Railroad Contractors—Soluble Glass secures against sparks, bridges, shingle roofs and machine shops; hardens plastered walls; produces good cement with fluorspar; best fireproof patent with oxyd manganese, at fifty cents per gallon, in barrels for sale by DR. L. FEUCHTWANGER,
No. 143 Maiden Lane, New York.
N. B.—Rare metals and chemicals, platina, cadmium, aluminum, bismuth, &c., &c. 13 5*

SECOND-HAND SLIDE LATHES, IRON Planers, Steam Engines, Upright Drills, Boring Mills, Woodworth Planing Machines, Sash, Tenoning and Mortising Machines, for sale by CHARLES G. WILLCOX, 135 North 3d st., Philadelphia, Pa. 13 4*

ENGINE LATHES, PLANERS, DRILLS, Woodworth Planing Machines, and a large assortment of tools for working in iron and wood, at greatly reduced prices, at the Machinery Depot, 135 North 3d st., Philadelphia, Pa. CHAS. H. SMITH. 13 4*

The best thing of its size and price—Sent by first mail. **THE ILLUSTRATED ANNUAL REGISTER OF RURAL AFFAIRS FOR 1859**—Containing practical information for the farmer and horticulturist. Embellished with 144 engravings, including Houses, Farm Buildings, Implements, Domestic Animals, Fruits, Flowers, &c. Price, 25 cents. Address
LUTHER TUCKER & SON, Albany, N. Y.
*** Agents wanted in all parts of the country, to whom twelve copies will be sent postpaid for $2, and larger quantities by express on still more favorable terms. 12 8*

WANTED TO PURCHASE—A SMALL MAchine Shop, with or without a foundry. Address W. H. S., Box 313, Birmingham, Conn. 12 2*

WANTED—A SITUATION BY A MECHANical Engineer and Draughtsman, who has had twenty years' practical experience. Good references can be given. Address W. W., Box 309, Salem, Mass. 12 3*

SPECIAL NOTICE—OUR CLIENT, JAMES YOUNG, of Glasgow, having transferred to a Company in the United States the exclusive right to use in the United States his patent for making oil from coal, which patent was issued by the government of the United States on the 23d day of March, 1852, and Mr. Young having guaranteed to such company that he will sustain and defend the said patent against all persons infringing the same. Notice is hereby given to all persons engaging in the business of making oil from from coal, that legal measures will be immediately adopted against all persons infringing said patent.
Dated 10th November, 1858.
BENEDICT & BOARDMAN,
Solicitors for said Young,
12 2* No. 128 Broadway, New York.

PORTABLE STEAM ENGINES.—S. C. HILLS, 12 Platt street, New York, offers for sale these Engines, with Boilers, Pumps, Heaters, etc., all complete, suitable for printers, carpenters, farmers, planters, &c. A 2½ horse can be seen in store; it occupies a space 5 by 3 feet; weight, 1,500 lbs.; price, $250. Other sizes in proportion. 2 e3w

BARREL MACHINERY—THE UNDERsigned, being sole proprietor of Crozier's Patent Barrel Machinery (universally acknowledged to be superior, in every particular, to any ever before offered to the public), is prepared to fill orders for the same at sight. The above machinery is adapted for all sizes and varieties of work. The above machinery is in successful operation in Oswego and Rochester, N. Y., Detroit, Mich., Chicago, Ill., Milwaukie, Wis., St. Louis, Mo., Camden, N. J., Philadelphia, Pa., Augusta, Ga., and different parts of Canada. For machines and rights, address PETER WELCH, Oswego, N. Y. 11 9*

OIL! OIL! OIL!—FOR RAILROADS, STEAMERS, and for machinery and burning. Pease's Improved Machinery and Burning Oil will save fifty per cent., and will not gum. This oil possesses qualities vitally essential for lubricating and burning, and found in no other oil. It is offered to the public upon the most reliable, thorough and practical test. Our most skillful engineers and machinists pronounce it superior and cheaper than any other, and the only oil that is in all cases reliable and will not gum. The Scientific American, after several tests, pronounced it "superior to any other they have ever used for machinery." For sale only by the inventor and manufacturer, F. S. PEASE, 61 Main st., Buffalo, N. Y.
N. B.—Reliable orders filled for any part of the United States and Europe. 1 13

"They are without a rival."—Scientific American.

WHEELER & WILSON'S SEWING MACHINES—New Style, price $50. Office, No. 343 Broadway, New York. Diagram of the Lock Stitch

made by this Machine. This is the only stitch that cannot be raveled, and that presents the same appearance upon each side of the seam. It is made with two threads, one upon each side of the fabric, and interlocked in the center of it. Send for a circular. 6 tf

THE WORKS OF THE AUBIN GAS CO., (General Office, No. 44 State st., Albany, N. Y.,) as now perfected, are adapted to all materials and localities, and are in successful operation in villages, factories, and private dwellings. For full information as to cost, probable income of public works, &c., apply as above. For plans, &c., see Scientific American of March 13th. 1 26

STEAM ENGINES, STEAM BOILERS, Steam Pumps, Saw and Grist Mills, Marble Mills, Rice Mills, Quartz Mills for gold quartz, Sugar Mills, Water Wheels, Shafting and Pulleys. The largest assortment of the above in the country, kept constantly on hand by WM. BURDON, 102 Front street, Brooklyn, N. Y. 1 26

HARRISON'S 20 AND 30 INCH GRAIN Mills constantly on hand. Address New Haven Manufacturing Co., New Haven, Conn. 1 13

MACHINE BELTING, STEAM PACKING, ENGINE HOSE.—The superiority of these articles, manufactured of vulcanized rubber, is established. Every belt will be warranted superior to leather, at one-third less price. The Steam Packing is made in every variety, and warranted to stand 300 degs. of heat. The hose never needs oiling, and is warranted to stand any required pressure; together with all varieties of rubber adapted to mechanical purposes. Directions, prices, &c., can be obtained by mail or otherwise, at our warehouse. NEW YORK BELTING AND PACKING COMPANY. JOHN H. CHEEVER, Treasurer. Nos. 37 and 38 Park Row, New York. 1 13

SECOND-HAND MACHINISTS' TOOLS—Viz., Engine and Hand Lathes, Iron Planers, Drills, Chuck Lathe, Gear Cutter and Vises, all in good order, and for sale low for cash. Also one new first-class Woodworth Planing and Matching Machine. Address FRANKLIN SKINNER, Agent, 14 Whitney avenue, New Haven, Conn. 1 13

CARY'S CELEBRATED DIRECT ACTING Self-Adjusting Rotary Force Pump, unequalled in the world for the purpose of raising and forcing water, or any other fluid. Manufactured and sold by
CARY & BRAINARD, Brockport, N. Y.
Also for sale by J. C. CARY, 240 Broadway, New York City. 12 tf

PECK'S PATENT DROP PRESS—ALL sizes, used for stamping copper or tin ware, silver ware ornaments, spoons, &c., and for forging gun work, lock work, carriage clips, &c. Also power and foot punching presses, and oval die chucks. Manufactured by MILO PECK & CO., 3 Whitney avenue, New Haven, Conn. 1 14*

TREATISE ON MACHINE BELTING—may be had gratis, on application to HOYT BROTHERS, 28 and 30 Spruce st., New York. 10 4*

EVERY MILLWRIGHT, ALL MILLOWNERS, and those interested in hydrodynamics, should become acquainted with the merits and principles of the improved Fourneyron Turbine Water Wheel, or the "Universal Turbine," a wheel the most economical in the use of water, and giving the highest percentage, with a partially raised gate, of any yet discovered. It gives from 75 to 97 per cent of power, according to the size of wheel and head employed. For information address S. K. BALDWIN,
Laconia, N. H.
N. B.—For low falls of one, two, or three feet, also for any fall, it will surpass all others. 2 13*

FOR ONE STAMP—SEVENTEEN ANATOMIcal engravings, illustrating and explaining how to cure diseases of the throat, lungs, muscles, joints, skin, blood, and digestive organs. This pamphlet will be sent free on receipt of one stamp, by J. R. STAFFORD, Practical Chemist, 315 Broadway, New York. 12 4*

FOR SALE—A FIRST-RATE FIFTEEN-HORSE power engine, and a twenty-horse power boiler, with force pump, heater, and connection pipes, all in good order, by TWEEDY, WHITE & CO., Danbury, Conn. 12 5*

CLAY RETORTS—THOS. HOADLEY, PATentee of the Patent Pyro-clay Gas Retorts—manufactory Nos. 32 and 34 Front st., Cleveland, O. 9 12*

FOR SALE—SECOND-HAND MACHINISTS' TOOLS—One large boring mill for car wheels, weight, 4,000 lbs.; cost $600—price, $250. One large boring mill (English) for car wheels, weight, 2,000 lbs.; cost $400—price, $100. One screw lathe, 8 feet bed, 20 inch. swing, weight, $1,500 lbs.; cost $350—price, $150. Also one 10 ft. planer; cost $850—price, $550. Apply to GEO. S. LINCOLN & CO.,
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AMERICAN MILLER AND MILLWRIGHT'S ASSISTANT—By Wm. C. Hughes, with forty illustrations. A new edition revised, with much additional matter. Price, one dollar by mail free of postage. HENRY CAREY BAIRD, Publisher, Philadelphia, Pa. 12 3

IRON PLANERS AND ENGINE LATHES of all sizes, also Hand Lathes, Drills, Bolt Cutters, Gear Cutters, Chucks, &c., on hand and finishing. These tools are of superior quality, and are for sale low for cash or approved paper. For cuts giving full description and prices, address "New Haven Manufacturing Co., New Haven, Conn." 1 13

WOODWORTH PLANERS—IRON FRAMES to plane 18 to 24 inches wide—at $90 to $110. For sale by S. C. HILLS, 12 Platt street New York. 1 26

WARTH'S SELF-ACTING WOOD-TURNING LATHES.—The best and most practical now in use; one boy will accomplish the work of four men. State and County rights for sale. Address A. WARTH, care W. H. Bertling, 23 Chambers st., New York, or the manufacturers, who have machines of all sizes on hand. Also a general assortment of machinists tools. Circulars sent. Address CARPENTER & PLASS, 479 First ave., New York. 2 13*

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Science and Art.

Trial of Steam Plows.

MESSRS. EDITORS—The trial of steam plows before the Executive Committee of the Illinois State Agricultural Society, took place at Decatur on the 10th inst. The weather was cold; rain and snow combined rendering the ground wet, soft, and slippery. The arrangements for the trial were not as complete as could have been desired, and the unfavorable weather and condition of the ground made the trial one of but partial success. On wet, soft grass land the plow did well, but it soon became too wet and slippery even there; on stubble land the plows, having no coulter, choked. The only plow exhibited was that of Mr. Fawkes, of Pennsylvania. It was provided with an upright locomotive boiler, having 151 flues set upon a long frame-work, which rested on a large roller-shaped driving wheel behind, and two guide wheels in front. A tank and box for wood or coal rested over the driving wheel. The guide wheels are in advance of the boiler. The engine is of 20-horse power, with 8-inch cylinders driving the master wheel by cogs on the ends of the roller. The driving wheel is shaped like a barrel, being six feet long and five feet high. The mode of moving this enables the inventor to stop his machine at once without any danger of breaking anything. The guide wheels are about eighteen inches wide, and three feet high, turned by a wheel under the control of the engineer. The tank, smaller than intended, holds five barrels of water. Mr. Fawkes estimates the consumption of wood at one cord per day, and of water at one and a half barrels per hour. The weight is loaded about seven tuns; cost $2,500. Cost of a ten-horse power, $1,500. The plows are on frame-work behind, capable of being lowered and raised by an assistant.

The machine drew six plows, cutting 12-inch furrows, between four and five inches deep. It plowed at the rate of one acre in forty minutes, on [illegible] ground it could go faster. On very wet ground the driving wheel slipped, which the inventor thinks he can obviate by putting spuds in it. The success was beyond expectation; and as there are several other steam plows in course of invention and erection, it is to be presumed that Yankee enterprise and ingenuity will soon put forth a steam plow that will surmount all obstacles to its success.

H. HINCKLEY.

Prairie Cottage, Ill., Nov., 1858.

Steam on the Canals.

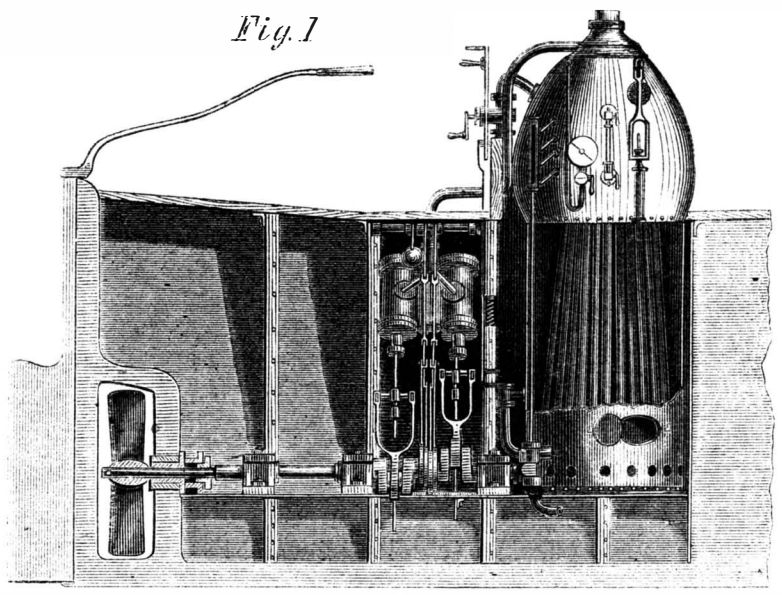
This question has lately engaged much public attention in this and other cities in the State of New York, and most of our cotemporaries have treated it as being entirely novel. We are glad to witness an awakening of the community to a sense of its importance, after years of our admonition regarding its necessity and practibility. In 1849, on page 76, volume VII., SCIENTIFIC AMERICAN, we urged the expediency of using steam power on the Erie and other canals, and at last we have beheld the application in 1858, carried out successfully.

Three steam propellers have made the trip from Lake Erie to this city, and we recently examined one of these—the *S. B. Ruggles*—a first class canal boat, double-decker, with engines built by David Bell, of Buffalo. They are similar to those which are favorites on the Upper Lakes, and are of good workmanship. The cylinders are suspended, 14×14 inches, working downwards, and yoked at right angles direct to the propeller shaft. The screw is 5½ feet in diameter, and the pitch 7 feet. She ran at the rate of from 3 to 4½ knots per hour, and consumed three tuns of coal in twenty-four hours; her cargo consisted of 5,000 bushels of corn, and hauled another boat with a similar cargo. This was very good for a first trip, with new machinery.

During the next two years some hundreds of steam engines will be required for this canal, and the most suitable in all respects for such a purpose is an important consideration. We believe that it will be found more convenient and more economical for each boat to be a self-propeller, and not to act as a tug, like those which have been built; small, efficient and compact engines are required to fulfill such conditions, and we therefore present an illustration of well-tried engines embracing such features.

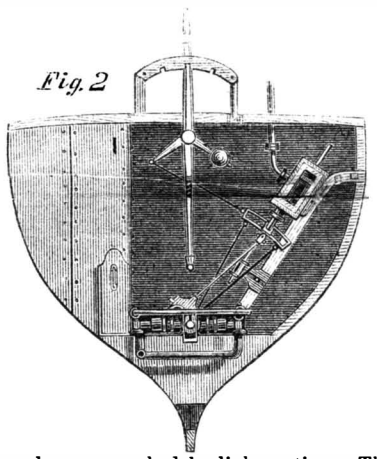
Fig. 1 is a longitudinal section, and Fig. 2 a transverse view behind the boiler. They belong to the boat *Thomas*, which has been running two years on the Forth and Clyde

Fig. 1



Canal, Scotland, and have been described in the Transactions of the Society of Engineers. The vessel is of iron and 120 tuns burden; the boiler is three feet in diameter, 7 feet 3 inches high from furnace; has 54 brass tubes 3 feet 5 inches long and tapered (a peculiarity) from 2¼ to 1¾ inches from the fire-box to the top. The entire heating surface of boiler is 110 square feet; the cylinders are bolted together on the bilge, with the steam box between; their bore 6¼ inches, stroke 10, and

Fig. 2



the valves are worked by link motion. The screw is 3½ feet in diameter, pitch 4 feet, and the whole weight of boiler, engines and screw is only 2½ tuns; the revolutions of shaft 130 per minute, speed five miles per hour, with 36 pounds pressure; coal used one tun per 100 miles. The entire cost of machinery is only $750. This boiler is applicable to any of our canal boats, and is capable of generating sufficient steam for two engines of 9 inch bore, and 15 inches stroke. The coal bunkers are on the opposite side of the engines, and the whole space occupied is only a few feet. The economy of this boiler and engines will contrast very favorably with any of those which have been built for our canals; and the saving of expense over horse-power previously used has been a third of the whole. As we learn that a great number of wild projects are proposed to be carried out this winter in Western New York, for the steam canal navigation of 1859, we present the above as worthy of much attention.

NEW BLACKING.—That ubiquitous individual, I. S. Clough, of 231 Pearl st., New York, has added another article to his already diverse collection of Yankee notions; it is the "Excelsior Vegetable Star Blacking," manufactured by A. Randell & Co., of this city. Mr. Clough assures us that it has been pronounced the best, "even by Members of Congress." There's praise!

Williams' Quartz Mill.

The number of mines which have yet to be worked and made available, renders every contribution to mining machinery and improved appliances for rendering useful the mineral contents of the earth valuable to the community, and our readers who are engaged in such operations will read with interest the following description of a quartz mill invented by L. W. Williams, of Nevada City, Cal., and patented by him April 20th, 1858.

Fig. 1

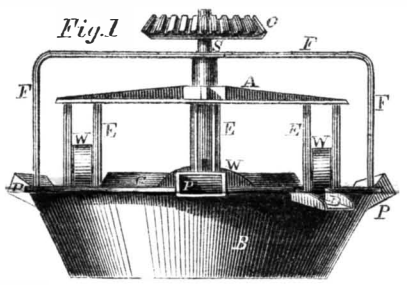


Fig. 2

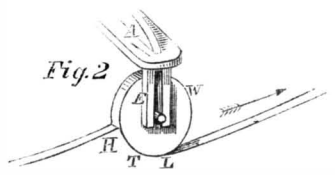


Fig. 1 is a perspective view of the machine, in which B is a circular battery, in whose center is the upright shaft, S, supported by the frame, F. O is a bevel wheel, and A is a cross, hung through its center upon the shaft, S, and to which are attached the slotted arms, E, that embrace and support the wheel, W. The axis of these wheels being placed within the slots in the arms in such manner as to permit the wheels being raised perpendicularly—the slots in the arms embracing the journals of the wheels, W, and operating as guides, whereby the wheels are kept in their places. C is the inner circle of the battery, B, and forms a support for shaft S. The distance of the inner from the outer circle at the bottom of the battery is but little more than the breadth of the face of the wheels, W. At the top, the space between them is sufficient to allow the wheels, together with their arms, to revolve without touching. P are ports for feeding the machine. D is the discharge, through which the quartz, after being reduced to sufficient fineness, escapes in the form of muddy water. A stream of water is constantly entering the bottom at some point, and flowing out at D.

Fig. 2 is a section of the inside bottom, T, over which the wheels, W, move, and by whose means they are alternately raised and let loose. L is the common base at which the inclines commence, H, the highest point of elevation to which the inclines are produced, being somewhat less than the radius of the wheels, W. The form of the drop-off from H to L is a segment of the circumference of the wheels, W.

When this machine is in operation, and the wheel, W, has arrived at the point, H, and begins to fall, it must move forward in the direction of the arrows a distance equal to one-half its diameter before it has fallen the distance from H to L; therefore, if this machine is made to revolve to the same speed with which a free body would fall in space a distance equal to that which the wheel falls, then the blow produced by the fall of the wheel, W, would be the same as if it were raised, and let fall, when the machine was at rest, and the wheel in the position shown in Fig. 2. The wheels, W, are made of such size in relation to the surface they travel over in a revolution of the machine, that the wear from stamping is brought a short distance further back at each revolution, thus keeping them equally worn; and if the wheels tend to wear more upon the outside edge than the inside, they can be reversed, and the outside edge placed upon the inside. The inside bottom or track, consisting of the inclines, T, may be cast in sections, and laid in a battery in such manner that when worn they can be easily removed, and replaced by others. When crushing with this mill, quicksilver is placed in each of the drops in the track, and the process of amalgamating carried on, all gold liberated remaining in the machine.

The inventor will be happy to furnish any additional particulars on being addressed as above.

New Gearing.

This invention is designed to supersede the ordinary cog or tooth gearing, and consists in having spiral ledges or threads formed on one wheel, and made to gear or work into corresponding grooves in its fellow. The inventor is E. A. Goodes, of Philadelphia, Pa., and it was patented this week.

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